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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 98

[EPA-HQ-OAR-2012-0934; FRL-9789-1]

RIN 2060-AR52

**2013 Revisions to the Greenhouse Gas Reporting Rule and Proposed
Confidentiality Determinations for New or Substantially Revised
Data Elements**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The EPA is proposing to amend the Greenhouse Gas Reporting Rule and to clarify or change specific provisions. Particularly, the EPA is proposing to amend a table in the General Provisions, to reflect revised global warming potentials of some greenhouse gases that have been published by the Intergovernmental Panel on Climate Change and to add global warming potentials for certain fluorinated greenhouse gases not currently listed in the table. This action also proposes confidentiality determinations for the reporting of new or substantially revised (i.e., requiring additional or different data to be reported) data elements contained in these proposed amendments to the Greenhouse Gas Reporting Rule.

DATES: Comments. Comments must be received on or before [INSERT THE DATE 45 DAYS AFTER PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER].

Public Hearing. The EPA does not plan to conduct a public hearing unless requested. To request a hearing, please contact the person listed in the **FOR FURTHER INFORMATION CONTACT** section of this preamble by [INSERT THE DATE 7 DAYS AFTER PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER]. If requested, the hearing will be conducted on [INSERT THE DATE 15 DAYS AFTER PUBLICATION OF THIS PROPOSED RULE IN THE FEDERAL REGISTER], in the Washington, DC area. The EPA will provide further information about the hearing on its webpage if a hearing is requested.

ADDRESSES: You may submit your comments, identified by Docket ID No. EPA-HQ-OAR-2012-0934 by any of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- Email: MRR_Corrections@epa.gov. Include Docket ID No. EPA-HQ-OAR-2012-0934 or RIN No. 2060-AR52 in the subject line of the message.
- Fax: (202) 566-1741.
- Mail: Environmental Protection Agency, EPA Docket Center (EPA/DC), Mailcode 6102T, Attention Docket ID No. EPA-HQ-OAR-2012-0934, 1200 Pennsylvania Avenue, NW., Washington, DC 20004.
- Hand/Courier Delivery: EPA Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. Such deliveries are accepted only during the normal hours of operation of the

Docket Center, and special arrangements should be made for deliveries of boxed information.

Additional Information on Submitting Comments: To expedite review of your comments by agency staff, you are encouraged to send a separate copy of your comments, in addition to the copy you submit to the official docket, to Carole Cook, U.S. EPA, Office of Atmospheric Programs, Climate Change Division, Mail Code 6207-J, Washington, DC, 20460, telephone (202) 343-9263, email address: GHGReporting@epa.gov.

Instructions: Direct your comments to Docket ID No. EPA-HQ-OAR-2012-0934, 2013 Revisions to the Greenhouse Gas Reporting Rule and Proposed Confidentiality Determinations for New or Substantially Revised Data Elements. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at <http://www.regulations.gov>, including any personal information provided, unless the comment includes information claimed to be confidential business information (CBI) or other information whose disclosure is restricted by statute.

Should you choose to submit information that you claim to be CBI, clearly mark the part or all of the information that you claim to be CBI. For information that you claim to be CBI in a disk or CD ROM that you mail to the EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within

the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. Send or deliver information identified as CBI to only the mail or hand/courier delivery address listed above, attention: Docket ID No. EPA-HQ-OAR-2012-0934. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

Do not submit information that you consider to be CBI or otherwise protected through <http://www.regulations.gov> or email. The <http://www.regulations.gov> website is an "anonymous access" system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through <http://www.regulations.gov> your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-

ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at the Air Docket, EPA/DC, EPA West Building, Room 3334, 1301 Constitution Ave., NW., Washington, DC. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: Carole Cook, Climate Change Division, Office of Atmospheric Programs (MC-6207J), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, DC 20460; telephone number: (202) 343-9263; fax number: (202) 343-2342; email address: GHGReportingRule@epa.gov.

For technical information, please go to the Greenhouse Gas Reporting Rule Program website

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

To submit a question, select Rule Help Center, followed by "Contact Us."

Worldwide Web (WWW). In addition to being available in the docket, an electronic copy of today's proposal will also be available through the WWW. Following the Administrator's signature, a copy of this action will be posted on EPA's greenhouse gas reporting rule website at

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

SUPPLEMENTARY INFORMATION:

Regulated Entities. The Administrator determined that this action is subject to the provisions of Clean Air Act (CAA) section 307(d). See CAA section 307(d)(1)(V) (the provisions of CAA section 307(d) apply to "such other actions as the Administrator may determine"). These are proposed amendments to existing regulations. If finalized, these amended regulations would affect certain owners and operators of facilities that directly emit greenhouse gases (GHGs) as well as certain suppliers. Regulated categories and examples of affected entities include those listed in Table 1 of this preamble.

Table 1. Examples of Affected Entities by Category

Category	NAICS	Examples of affected facilities
General Stationary Fuel Combustion Sources	Facilities operating boilers, process heaters, incinerators, turbines, and internal combustion engines.
	211	Extractors of crude petroleum and natural gas.
	321	Manufacturers of lumber and wood products.
	322	Pulp and paper mills.
	325	Chemical manufacturers.
	324	Petroleum refineries, and manufacturers of coal products.
	316, 326, 339	Manufacturers of rubber and miscellaneous plastic products.
	331	Steel works, blast furnaces.
	332	Electroplating, plating, polishing, anodizing, and coloring.
	336	Manufacturers of motor vehicle parts and accessories.
	221	Electric, gas, and sanitary services.
	622	Health services.
	611	Educational services.
Electricity Generation	221112	Fossil-fuel fired electric generating units, including units owned by federal and municipal governments and units located in Indian Country.
Acid Gas Injection Projects	211111 or 211112	Projects that inject natural gas containing CO ₂ underground.
Adipic Acid Production	325199	Adipic acid manufacturing facilities.
Aluminum Production	331312	Primary Aluminum production facilities.
Ammonia Manufacturing	325311	Anhydrous and aqueous ammonia manufacturing facilities.

Category	NAICS	Examples of affected facilities
Cement Production	327310	Portland cement manufacturing plants.
CO ₂ Enhanced Oil and Gas Recovery Projects	211	Oil and gas extraction projects using CO ₂ enhanced oil and gas recovery.
Electrical Equipment Use	221121	Electric bulk power transmission and control facilities.
Electrical Equipment Manufacture or Refurbishment	33531	Power transmission and distribution switchgear and specialty transformers manufacturing facilities.
Electronics Manufacturing	334111	Microcomputers manufacturing facilities.
	334413	Semiconductor, photovoltaic (solid-state) device manufacturing facilities.
	334419	LCD unit screens manufacturing facilities. MEMS manufacturing facilities.
Ethanol Production	325193	Ethyl alcohol manufacturing facilities.
Ferroalloy Production	331112	Ferroalloys manufacturing facilities.
Fluorinated GHG Production	325120	Industrial gases manufacturing facilities.
Food Processing	311611	Meat processing facilities.
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
Glass Production	327211	Flat glass manufacturing facilities.
	327213	Glass container manufacturing facilities.
	327212	Other pressed and blown glass and glassware manufacturing facilities.
GS Sites	NA	CO ₂ geologic sequestration projects.
HFC-22 Production and HFC-23 Destruction	325120	Chlorodifluoromethane manufacturing facilities.
Hydrogen Production	325120	Hydrogen manufacturing facilities.

Category	NAICS	Examples of affected facilities
Importers and Exporters of Pre-charged Equipment and Closed-Cell Foams	423730	Air-conditioning equipment (except room units) merchant wholesalers.
	333415	Air -conditioning equipment (except motor vehicle) manufacturing.
	423620	Air -conditioners, room, merchant wholesalers.
	443111	Household Appliance Stores.
	326150	Polyurethane foam products manufacturing.
	335313	Circuit breakers, power, manufacturing.
	423610	Circuit breakers merchant wholesalers.
Industrial Waste Landfills	562212	Solid waste landfills.
	221320	Sewage treatment facilities.
	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills.
	322130	Paperboard mills.
	311611	Meat processing facilities.
	311411	Frozen fruit, juice and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
Industrial Wastewater Treatment	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills.
	322130	Paperboard mills.
	311611	Meat processing facilities.
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
	325193	Ethanol manufacturing facilities.
	324110	Petroleum refineries.
Iron and Steel Production	331111	Integrated iron and steel mills, steel companies, sinter plants, blast furnaces, basic oxygen process furnace shops.
Lead Production	331419	Primary lead smelting and refining facilities.

Category	NAICS	Examples of affected facilities
	331492	Secondary lead smelting and refining facilities.
Lime Production	327410	Calcium oxide, calcium hydroxide, dolomitic hydrates manufacturing facilities.
Magnesium Production	331419	Primary refiners of nonferrous metals by electrolytic methods.
Municipal Solid Waste Landfills	562212	Solid waste landfills.
	221320	Sewage treatment facilities.
Nitric Acid Production	325311	Nitric acid manufacturing facilities.
Oil and Natural Gas Systems	486210	Pipeline transportation of natural gas.
	221210	Natural gas distribution facilities.
	325212	Synthetic rubber manufacturing facilities.
Petrochemical Production	32511	Ethylene dichloride manufacturing facilities.
	325199	Acrylonitrile, ethylene oxide, methanol manufacturing facilities.
	325110	Ethylene manufacturing facilities.
	325182	Carbon black manufacturing facilities.
Petroleum Refineries	324110	Petroleum refineries.
Phosphoric Acid Production	325312	Phosphoric acid manufacturing facilities.
Petroleum and Natural Gas Systems	486210	Pipeline transportation of natural gas.
	221210	Natural gas distribution facilities.
	211	Extractors of crude petroleum and natural gas.
	211112	Natural gas liquid extraction facilities.
Pulp and Paper Manufacturing	322110	Pulp mills.
	322121	Paper mills.
	322130	Paperboard mills.
Soda Ash Manufacturing	325181	Alkalies and chlorine manufacturing facilities.

Category	NAICS	Examples of affected facilities
Silicon Carbide Production	327910	Silicon carbide abrasives manufacturing facilities.
Sulfur Hexafluoride (SF ₆) from Electrical Equipment	221121	Electric bulk power transmission and control facilities.
Titanium Dioxide Production	325188	Titanium dioxide manufacturing facilities.
Underground Coal Mines	212113	Underground anthracite coal mining operations.
	212112	Underground bituminous coal mining operations.
Zinc Production	331419	Primary zinc refining facilities.
	331492	Zinc dust reclaiming facilities, recovering from scrap and/or alloying purchased metals.
Suppliers of Industrial Greenhouse Gases	325120	Industrial gas manufacturing facilities.
Suppliers of Petroleum Products	324110	Petroleum refineries.
Suppliers of Natural Gas and Natural Gas Liquids	221210	Natural gas distribution facilities.
	211112	Natural gas liquid extraction facilities.
Suppliers of Carbon Dioxide (CO ₂)	325120	Industrial gas manufacturing facilities.

Table 1 of this preamble is not intended to be exhaustive, but rather provides a guide for readers regarding facilities likely to be affected by this action. Other types of facilities than those listed in the table could also be subject to reporting requirements. To determine whether you are affected by this action, you should carefully examine the applicability criteria found in 40 CFR part 98, subpart A or the relevant criteria in the sections related to suppliers and direct emitters of GHGs. If you have questions regarding the applicability of this action to a particular facility, consult

the person listed in the preceding **FOR FURTHER GENERAL INFORMATION CONTACT** Section.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

AF&PA	American Forest & Paper Association
AR4	Fourth Assessment Report
BAMM	best available monitoring methods
CAA	Clean Air Act
CBI	confidential business information
CBP	U.S. Customs and Border Protection
CEMS	continuous emissions monitoring system
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
DOC	degradable organic carbon
EAF	electric arc furnace
e-GGRT	Electronic Greenhouse Gas Reporting Tool
EF	emission factor
EIA	Energy Information Administration
EO	Executive Order
EPA	U.S. Environmental Protection Agency
°F	degrees Fahrenheit
FR	<u>Federal Register</u>
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GWP	global warming potential
HFC	hydrofluorocarbon
HHV	high heat value
IPCC	Intergovernmental Panel on Climate Change
ISBN	International Standard Book Number

F-GHG	fluorinated greenhouse gas
F-HTF	fluorinated heat transfer fluid
kg	kilograms
LDC	Local Distribution Company
Mscf	thousand standard cubic feet
MSW	municipal solid waste
N ₂ O	nitrous oxide
NAICS	North American Industry Classification System
NCASI	National Council for Air and Stream Improvement
NGL	natural gas liquid
OMB	Office of Management and Budget
ORIS	Office of the Regulatory Information System
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
RFA	Regulatory Flexibility Act
SAR	Second Assessment Report
SF ₆	sulfur hexafluoride
SNAP	Significant New Alternative Policy
TAR	Third Assessment Report
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
UMRA	Unfunded Mandates Reform Act of 1995

Organization of This Document. The following outline is provided to aid in locating information in this preamble.

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- V. Subpart QQ – Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-Charged Equipment or Closed-Cell Foams
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- H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act
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I. Background

A. How is this preamble organized?

The first section of this preamble contains background information regarding the origin of the proposed amendments. This section also discusses EPA's legal authority under the Clean Air Act (CAA) to promulgate (including subsequent amendments to) 40 CFR part 98 of the Greenhouse Gas Reporting Rule (hereinafter referred to as "Part 98"). Section II of this preamble is organized by Part 98 subpart and contains detailed information on the proposed revisions to the GHG Reporting Rule and the rationale for the proposed amendments. Section III of this preamble discusses the effective date of the proposed revisions for new and existing reporters and the options EPA is considering for revising and republishing emissions estimates

for the reporting years 2010, 2011, and 2012. Section IV of this preamble discusses the proposed confidentiality determinations for new or substantially revised (i.e., requiring additional or different data to be reported) data reporting elements. Section V of this preamble discusses the impacts of the proposed amendments, primarily for current and new reporters of gases proposed to have revised or new global warming potentials (GWPs) listed in Part 98. Finally, Section VI of this preamble describes the statutory and executive order requirements applicable to this action.

B. Background on the Proposed Action

Part 98 was published in the Federal Register on October 30, 2009 (74 FR 56260). Part 98 became effective on December 29, 2009, and requires reporting of GHGs from certain facilities and suppliers. Subsequent notices were published in 2010 promulgating the requirements for subparts T, FF, II, and TT (75 FR 39736, July 12, 2010); subparts I, L, DD, QQ, and SS (75 FR 74774, December 1, 2010); and subparts RR and UU (75 FR 75060, December 1, 2010). A number of subparts have been revised since promulgation (75 FR 79092, December 17, 2010; 76 FR 73866, November 29, 2011; 77 FR 10373, February 22, 2012; 77 FR 51477, August 24, 2012). The EPA is proposing to further revise Part 98. This proposed revision includes technical corrections, clarifying revisions, and additional amendments to Part 98.

Changes proposed in this notice for certain source categories include, among other things, clarifying the data reporting requirements for certain facilities; correcting ambiguities or minor inconsistencies in greenhouse gas monitoring, calculation, and reporting requirements; amending monitoring and quality assurance methods to provide flexibility for certain facilities; and making other corrections identified as a result of working with the affected sources during rule implementation and outreach. In conjunction with this action, we are proposing confidentiality determinations for the new and substantially revised (i.e., requiring additional or different data to be reported) data elements under this proposed amendment.

In the first two years of implementation of Part 98, the EPA responded to thousands of questions from reporters and engaged in a stakeholder and public testing process to help improve development of EPA's electronic reporting system. Through these extensive outreach efforts, the EPA has improved our understanding of the technical challenges and burden associated with implementation of Part 98 provisions. The proposed changes would improve the Greenhouse Gas Reporting Program (GHGRP) by clarifying compliance obligations and reducing confusion for reporters, improving the consistency of the data collected, and ensuring that data collected through the

GHGRP is representative of industry and comparable to other inventories.

The EPA is also proposing amendments to Table A-1 to Subpart A, General Provisions, of Part 98 to revise the values for the GWP of some GHGs and adding some GHGs (with associated GWP values) that are not currently included in the table.¹ The newly added GWP values are from the Intergovernmental Panel for Climate Change (IPCC) Fourth Assessment Report² (AR4) and EPA assessments of data supporting GWP estimates for certain GHGs identified since promulgation. Data supporting the proposed GWP estimates include information provided by chemical manufacturers currently reporting under the GHGRP as well as published literature. The EPA is proposing these changes to ensure comparability of data collected in the GHGRP to the Inventory of U.S. Greenhouse Gas Emissions and Sinks (hereinafter referred to as "Inventory") that the EPA compiles annually to meet international commitments and to GHG inventories prepared by other countries; to reflect improved scientific understanding;

¹ The GWP, a metric that incorporates both the heat-trapping ability and atmospheric lifetime of each GHG, can be used to develop comparable numbers by adjusting all GHGs relative to the GWP of CO₂. When quantities of the different GHGs are multiplied by their GWPs, the different GHGs can be compared on a CO₂ basis. The GWP of CO₂ is 1.0, and the GWP of other GHGs are expressed relative to CO₂. IPCC GWP values are based on the effects of the greenhouse gases over a 100-year time horizon. See 74 FR 16448, 53 (April 10, 2009).

²IPCC Fourth Assessment Report (AR4), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

and to promote consistency across the estimation methods used in the rule.

C. Legal Authority

The EPA is proposing these rule amendments under its existing CAA authority provided in CAA section 114. As stated in the preamble to the 2009 final GHG reporting rule (74 FR 56260, October 30, 2009), CAA section 114(a)(1) provides the EPA broad authority to require the information proposed to be gathered by this rule because such data would inform and are relevant to the EPA's carrying out a wide variety of CAA provisions. See the preambles to the proposed (74 FR 16448, April 10, 2009) and final Part 98 (74 FR 56260) for further information.

In addition, the EPA is proposing confidentiality determinations for certain new or substantially revised data elements required under the proposed GHG Reporting Rule under its authorities provided in sections 114, 301 and 307 of the CAA. As mentioned above, CAA section 114 provides the EPA authority to obtain the information in Part 98. Section 114(c) requires that EPA make publicly available information obtained under section 114 except for information (excluding emission data) that qualify for confidential treatment. The Administrator has determined that this action (proposed amendments and confidentiality determinations) is subject to the provisions of section 307(d) of the CAA.

II. Technical Corrections and Other Amendments

The EPA is proposing to revise Part 98 to introduce technical corrections, clarifying revisions, and other amendments to Part 98 to improve the quality and consistency of the data collected by the EPA in response to feedback received from stakeholders during program implementation. The proposed amendments include the following types of changes:

- Revising GWPs for GHGs defined in Table A-1 of subpart A of Part 98 for consistency with the Inventory, and adding GWPs for fluorinated greenhouse gases (F-GHGs) used by Part 98 facilities that are not currently included in Table A-1 to reflect industry practices.
- Changes to clarify the applicability of calculation methods to certain sources at a facility.
- Corrections to terms and definitions in certain equations to provide clarity or better reflect actual operating conditions.
- Changes to correct typographical errors or cross references within and between subparts.
- Amending monitoring and quality assurance methods to provide flexibility for certain facilities.
- Corrections to data reporting requirements so that they more closely conform to the information used to perform emission calculations.
- Adding readily available data reporting requirements that would allow the EPA to verify the data submitted and assess the reasonableness of the data reported.
- Other amendments or corrections related to certain issues identified during rule implementation and outreach.

Sections II.A through II.AA of this preamble describe the more substantive corrections, clarifying, and other amendments we are proposing for each subpart. The proposed amendments discussed in this preamble include: changes that affect the

applicability of a subpart, changes that affect the applicability of a calculation method to a specific source at a facility, changes or corrections to calculation methods that substantially revise the calculation method or output of the equation, revisions to data reporting requirements that would substantively clarify the reported data element or introduce a new data element, clarifications of general monitoring and quality assurance requirements, and new terms and definitions. To reduce the length of this preamble, we have summarized less substantive corrections for each subpart in the memorandum, "Table of 2013 Revisions to the Greenhouse Gas Reporting Rule" (hereafter referred to as the "Table of Revisions") available in the docket for this rulemaking (EPA-HQ-OAR-2012-0934). The proposed changes discussed in the Table of Revisions are straightforward clarifications of requirements to better reflect the EPA's intent, simple corrections to calculation terms or cross-references that do not affect the output of calculations, harmonizing changes within a subpart (such as changes to terminology), simple editorial and minor error corrections, or removal of redundant text. The Table of Revisions describes each proposed change within a subpart, including those itemized in this preamble, and provides the current rule text and the proposed correction. Where the proposed change is listed only in the Table of Revisions, the rationale for the proposed change is

also listed there. You may comment on those proposed technical corrections, clarifying and other amendments identified in the Table of Revisions as well as any other part of this proposal.

A. Subpart A - General Provisions

1. Proposed Amendments to Subpart A - Global Warming Potentials

In today's action, we are proposing to revise Table A-1 of subpart A of Part 98 (hereafter referred to as "Table A-1") by updating the GWP values of certain compounds and adding certain F-GHGs and their GWPs not previously included in Table A-1. These proposed changes relate to facilities and suppliers under Part 98 reporting the following greenhouse gases: methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and other F-GHGs.³

The changes are being proposed for two reasons. First, we propose to revise GWPs for GHGs currently in Table A-1 to ensure continued consistency with the Inventory as the Inventory begins to use GWPs from the IPCC Fourth Assessment Report. Second, we propose to add GWPs for F-GHGs that are not currently included in Table A-1 but that are emitted in significant quantities or for which newly available data or literature supports the

³ Fluorinated greenhouse gases, as defined in 40 CFR 98.6, include sulfur hexafluoride, nitrogen trifluoride, and any fluorocarbon except for controlled substances as defined at 40 CFR part 82, subpart A and substances with vapor pressures of less than 1 mm of Hg absolute at 25 degrees C.

establishment of a GWP in Table A-1. The background and general rationale for these proposed amendments are discussed in Section II.A.1.a of this preamble. The proposed changes to the GWPs currently in Table A-1 and the GWP determinations for new proposed compounds in Table A-1 are discussed in Sections II.A.1.b and II.A.1.c of this preamble. The schedule for the proposed amendments is discussed in Section III.A of this preamble.

The EPA is also considering options for revising and republishing emissions estimates for the reporting years 2010, 2011, and 2012 using the revised GWPs in Table A-1. The EPA is seeking comment on these options, which are discussed in Section III.B of this preamble. Because reporters affected by the GHG reporting rule use the GWPs in Table A-1 to calculate annual GHG emissions (or GHGs supplied, as applicable), and, for source categories with a carbon dioxide equivalent (CO₂e)-based threshold, to determine whether they are required to report, the proposed new and revised GWPs could change the number of reporters and the magnitude of emissions reported for some source categories. If these amendments are finalized, some facilities to which the rule did not previously apply may be required to report based on increases in calculated GHG quantities that affect applicability (see Section V of this preamble for additional information). These impacts and the

potential compliance costs of the proposed amendments for affected subparts are discussed in Section V of this preamble.

a. Background and General Rationale for GWP Revisions

U.S. GHG reporting programs and the IPCC Fourth Assessment Report. As a party to the United Nations Framework Convention on Climate Change (UNFCCC), the United States participates in ongoing negotiations with the international community to promote global cooperation on climate change. The UNFCCC treaty, ratified by the U.S. in 1992, sets an overall framework for intergovernmental efforts to address the challenges posed by climate change.⁴ As part of its commitment to the UNFCCC, the U.S. submits the Inventory of U.S. Greenhouse Gas Emissions and Sinks to the Secretariat of the UNFCCC as an annual reporting requirement.⁵ The Inventory is a comprehensive assessment of U.S. GHG emissions based on national-level data and is prepared by EPA's Office of Air and Radiation in coordination with other federal agencies. To ensure consistency and comparability with national inventory data submitted by other UNFCCC Parties, the Inventory submitted to the UNFCCC uses internationally-accepted

⁴ See United Nations Framework Convention on Climate Change, 1992. Available at: <http://unfccc.int/resource/docs/convkp/conveng.pdf>. For more information about the UNFCCC, please refer to: <http://www.unfccc.int>.

⁵ See Articles 4 and 12 of the Convention on Climate Change. Parties to the Convention, by ratifying, "shall develop, periodically update, publish and make available * * * national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies * * *"

methods agreed upon by the Parties (including the United States) to develop and characterize emission estimates.

As described in the preamble of the proposed GHG Reporting Rule (74 FR 16448, April 10, 2009), the GHGRP is intended to supplement and complement existing U.S. government programs related to climate policy and research, including the Inventory submitted to the UNFCCC. The GHGRP provides data to develop and inform inventories and other U.S. climate programs by advancing the understanding of emission processes and monitoring methodologies for particular source categories or sectors. Specifically, the GHGRP complements the Inventory and other U.S. programs by providing data from individual facilities and suppliers above certain thresholds.

Collected facility, unit, and process-level GHG data from the GHGRP will provide or confirm the national statistics and emission estimates presented in the Inventory, which are calculated using aggregated national data. The EPA has received encouragement from stakeholders to use GHG data from the GHGRP to complement the Inventory, such as from EPA's stakeholder workshop for natural gas systems.⁶

During the development of the GHG Reporting Rule, the EPA generally proposed and finalized estimation methodologies and

⁶ Stakeholder Workshop on the U.S. GHG Inventory for Natural Gas Systems. September 13-14, 2012, Washington, DC. See <http://www.epa.gov/climatechange/ghgemissions/Sept2012stakeholderworkshop.html>.

reporting metrics that were based on recent scientific data and that were consistent with the international reporting standards under the UNFCCC. This approach allows the data collected under the GHGRP to be easily compared to the data in the Inventory and to data from other national and international programs.

Specifically, the EPA generally promulgated GWP values published in the IPCC Second Assessment Report (hereinafter referred to as "SAR GWP values") to convert mass emissions (or supply) of each GHG into a common unit of measure, CO₂e, for final reporting. At the time that Part 98 was finalized, in order to comply with international reporting standards under the UNFCCC, official emission estimates were to be reported by the United States and other parties using SAR GWP values. Although the IPCC published its Fourth Assessment Report (AR4) prior to publication of the final GHG reporting rule (74 FR 56260), the UNFCCC continued to require the use of SAR GWP values for reporting. For consistency and comparability of the data collected between the GHGRP and the Inventory, the EPA adopted the SAR GWP values in Table A-1 to subpart A of Part 98, with the exception of GWPs for certain F-GHGs adopted from the IPCC AR4.⁷

⁷ For certain F-GHGs that were not addressed by the SAR but were included in Part 98 (e.g., NF₃), the EPA promulgated up-to-date GWPs from the IPCC AR4. (The one exception was sevoflurane, whose GWP was based on a study by Langbein et al. as explained in the February 6, 2009 Technical Support Document for Industrial Gas Supply: Production, Transformation, and Destruction of Fluorinated GHGs and N₂O.) This approach was consistent with

The IPCC AR4 was published in 2007 and is among the most current and comprehensive peer-reviewed assessments of climate change. The AR4 provides revised GWPs of several GHGs relative to the values provided in previous assessment reports, following advances in scientific knowledge on the radiative efficiencies and atmospheric lifetimes of these GHGs and of CO₂. Because the GWPs provided in the AR4 reflect an improved scientific understanding of the radiative effects of these gases in the atmosphere, the values provided are more appropriate for supporting the overall goal of the reporting program to collect GHG data than the SAR GWP values currently included in Table A-1. While we recognize that GWPs reflecting further scientific advances may become available in the near future (e.g., the IPCC Fifth Assessment Report, currently in development), it is not now EPA's intent to revise the GWPs in Table A-1 each time new data are published. Rather, we understand that it is also important for stakeholders to have consistent, predictable requirements to avoid confusion and additional burden. As discussed below, we are not proposing to adopt GWP values from the Fifth Assessment Report because it is our intent to have the GHGRP complement the requirements of the Inventory.

the GWP values used for F-GHGs in the Inventory prepared by the EPA as part of the U.S. commitment to the UNFCCC.

On March 15, 2012, the UNFCCC published a decision, reached by UNFCCC member parties, to require countries submitting an annual report in 2015 and beyond to use GWP values from the IPCC AR4 (hereinafter referred to as the "AR4 GWP values").⁸ Accordingly, the United States has a commitment to submit the Inventory for 2015 and future years using the revised AR4 GWP values. The Inventory for 2015 will contain national level estimates of emissions for each year from 1990-2013. In order to ensure that the GHGRP continues to complement and inform the Inventory submitted to the UNFCCC and relies on recent scientific data, we are proposing to revise the GWP values in Table A-1 of Part 98 to reflect the updated AR4 GWP values. The proposed changes would keep the reporting metrics in Part 98 consistent with the updated international reporting standards followed by the Inventory. Additionally, the proposed changes would allow for improved understanding of the radiative forcing from reported GHG emissions and supply, based on GWP values that are more up-to-date relative to the values currently provided in Table A-1. The proposed changes to Table A-1 would also ensure

⁸ Please refer to <http://unfccc.int/>. See Decision 15/CP.17, Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention. Parties of the Convention "* * * Decide[s] that, from 2015 until a further decision by the Conference of the Parties, the global warming potentials used by Parties to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks of greenhouse gases shall be those listed in the column entitled "Global warming potential for given time horizon" in table 2.14 of the errata to the contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* * *

that the data collected in the GHGRP can be compared to other national and international inventories. These proposed changes are in keeping with the Agency's decision to use methods consistent with UNFCCC guidelines in the development of the October 30, 2009 GHG Reporting Rule.

We recognize that some other EPA programs use the GWP values in Table A-1 to determine applicability of the program to direct emitters or suppliers above certain thresholds. For example, EPA's Greenhouse Gas Tailoring Rule (75 FR 31514; June 3, 2010) cross-references Table A-1 for calculating GHG emissions under the PSD and title V permitting programs. See, e.g., 40 CFR 52.21(b)(49)(ii)(a). Because the permitting applicability is based partly on CO₂e emissions, which are calculated using the GWP values codified in Table A-1, an amendment to Table A-1 may affect program applicability for a source. As a result, a source that is assessing applicability under the PSD or title V permitting program should be aware of the proposed changes to Table A-1 that may affect the CO₂e emissions of the source once the Table A-1 amendment is promulgated and effective.⁹ To the extent that a Table A-1

⁹ This reliance of other EPA programs on Table A-1 promotes implementation consistency and avoids having to revise the other rules each time a GWP revision occurs. As noted in the Tailoring Rule preamble, "[a]ny changes to Table A-1 of the mandatory GHG reporting rule regulatory text must go through an appropriate regulatory process. In this manner, the values used for the permitting programs will reflect the latest values adopted for usage by EPA

amendment raises permitting implementation questions or concerns, EPA's regional offices and the Office of Air Quality Planning and Standards, which manage the PSD and title V programs, will work with permitting authorities and other stakeholders as necessary to provide guidance on their issues and concerns. While we are seeking comments on specific GWP values proposed in this action, we are not reopening for comment the decision made in the Tailoring Rule, or any other rules or programs, to reference Table A-1.

Use of the AR4 GWPs is also in keeping with other EPA programs. For example, the Agency decided to use these values in rules published jointly with the Department of Transportation, National Highway Traffic Safety Administration, the "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards" (75 FR 25324, May 7, 2010).¹⁰

Section II.A.1.b of this preamble lists the changes we are proposing to incorporate as a result of the updated AR4 GWPs.

Identification of GWPs in the scientific literature.

During implementation of Part 98, the EPA has collected data on the range and volume of F-GHGs emitted and supplied in the U.S. market by various F-GHG producers, importers,

after a regulatory process and will be consistent with those values used in the EPA's mandatory GHG reporting rule." (75 FR at 31522; June 3, 2010).

¹⁰ While we are seeking comments on specific GWP values proposed in this action, we are not reopening for comment the decision made in the Light Duty Vehicle Rule, or any other rules or programs, to use AR4 GWPs.

exporters, and manufacturers using F-GHGs in their production processes (e.g., electronics manufacturing, magnesium production).¹¹ The EPA reviewed available production and usage data for existing and newly synthesized gases and assessed available data substantiating the GWP calculation for gases for which a GWP value was not included in Table A-1 in the October 30, 2009 final rule. In this action, we are proposing to amend Table A-1 to add F-GHGs emitted or supplied by reporters under subparts I (Electronics Manufacturing), L (Fluorinated Gas Production), T (Magnesium Production), OO (Industrial GHG Suppliers), and QQ (Importers and Exporters of G-GHGs Contained in Pre-Charged Equipment and Closed-Cell Foams). Section II.A.1.c of this preamble lists the changes we are proposing to incorporate the additional F-GHGs into Table A-1.

The EPA is proposing to amend Table A-1 to subpart A of Part 98 to add 26 F-GHGs for which we have identified a GWP based on an assessment of recent scientific literature. Table A-1 to subpart A is a compendium of GWP values of select GHGs that are required to be reported under one or more subparts of Part 98, and where the EPA has identified the GWP in the IPCC AR4

¹¹ Fluorinated heat transfer fluids are defined as F-GHGs used for temperature control, device testing, cleaning substrate surfaces and other parts, and soldering in certain types of electronics manufacturing production processes. Under subpart I, the lower vapor pressure limit of 1 mm Hg in absolute at 25 °C in the definition of fluorinated greenhouse gas in 40 CFR 98.6 does not apply.

report or other sources. As acknowledged in the preamble to the final Part 98 (74 FR 56260, October 30, 2009), Table A-1 is not a complete listing of current or potential compounds, but reflects only those GWPs for listed materials that had been synthesized, their atmospheric properties investigated, and the results published and reviewed prior to promulgation of the final rule. Currently, some Part 98 source categories provide calculation methodologies and reporting requirements for F-GHGs for which GWP values were not available in the IPCC SAR, TAR, AR4, or other scientific assessments at promulgation. As noted in the preamble to the final Part 98 (74 FR 56260), it is the EPA's intent to periodically update Table A-1 as GWPs are evaluated or re-evaluated by the scientific community.

b. Proposed Revisions from the IPCC Fourth Assessment Report

The proposed amendments to Table A-1 would revise the GWPs for 23 GHGs to reflect the 100-year GWP values adopted by the UNFCCC and published in the IPCC AR4. Table 2 of this preamble lists the GHGs whose GWP values we are proposing to revise, along with the GWP values currently listed in Table A-1 and the proposed revised GWP values from the IPCC AR4.

Table 2. GHGs with proposed revised GWPs for Table A-1.

Name	CAS No.	Current Global Warming Potential ^a	Proposed Global Warming Potential ^b
Methane	74-82-8	21	25
Nitrous oxide	10024-97-2	310	298

Name	CAS No.	Current Global Warming Potential ^a	Proposed Global Warming Potential ^b
HFC-23	75-46-7	11,700	14,800
HFC-32	75-10-5	650	675
HFC-41	593-53-3	150	92
HFC-125	354-33-6	2,800	3,500
HFC-134	359-35-3	1,000	1,100
HFC-134a	811-97-2	1,300	1,430
HFC-143	430-66-0	300	353
HFC-143a	420-46-2	3,800	4,470
HFC-152a	75-37-6	140	124
HFC-227ea	431-89-0	2,900	3,220
HFC-236fa	690-39-1	6,300	9,810
HFC-245ca	679-86-7	560	693
HFC-43-10mee	138495-42-8	1,300	1,640
Sulfur hexafluoride	2551-62-4	23,900	22,800
PFC-14 (Perfluoromethane)	75-73-0	6,500	7,390
PFC-116 (Perfluoroethane)	76-16-4	9,200	12,200
PFC-218 (Perfluoropropane)	76-19-7	7,000	8,830
PFC-3-1-10 (Perfluorobutane)	355-25-9	7,000	8,860
Perfluorocyclobutane	115-25-3	8,700	10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	7,500	9,160
PFC-5-1-14 (Perfluorohexane)	355-42-0	7,400	9,300

^a From Table A-1 to subpart A of the October 30, 2009 GHG Reporting Rule.

^b From Table 2.14 of the errata to Working Group 1 of the IPCC AR4.

We are proposing to adopt only GWP values based on a 100-year time horizon, although other time horizons are available in the IPCC AR4 (e.g., 20-year or 500-year GWPs). As acknowledged in the April 10, 2009 proposed GHG reporting rule (74 FR 16448), the parties to the UNFCCC agreed to use GWPs based upon a 100-year time horizon. Therefore, 100-year GWPs are used as the metric in the Inventory. Because the proposed changes are intended to make the GHGRP reporting methods more consistent with the Inventory, we are not considering the use of GWPs based on other time horizons.

As noted above, Table A-1 already includes AR4 GWPs for chemicals for which GWPs were not presented in the SAR (e.g., fluorinated ethers); the EPA is therefore proposing to retain the current GWPs for these chemicals (and for sevoflurane, which has not been included in any IPCC assessment but already is included in Table A-1). A complete listing of the current GWPs in Table A-1 to subpart A and the AR4 GWP values may be found in the memorandum, "Assessment of Emissions and Cost Impacts of 2013 Revisions to the Greenhouse Gas Reporting Rule" (hereafter referred to as "Impacts Analysis") (see Docket ID No. EPA-HQ-OAR-2012-0934).

For one set of chemicals, fluorinated ethers and alcohols, the EPA is seeking comment on adopting GWPs from an international scientific assessment published more recently than AR4, the WMO (World Meteorological Organization) Scientific Assessment of Ozone Depletion: 2010 (Global Ozone Research and Monitoring Project-Report No. 52, 516 pp., Geneva, Switzerland, 2011). Like the IPCC Assessment Reports, the WMO Scientific Assessments include regularly updated international reviews of the scientific findings on the lifetimes and impacts of trace gases in the atmosphere. While the primary focus of the WMO Scientific Assessments is depletion of stratospheric ozone, they have also included estimated GWPs for a number of fluorocarbons

that do not deplete stratospheric ozone (many of which are substitutes for ozone-depleting substances) since 1989.

The current Table A-1 includes AR4 GWPs for several fluorinated ethers and alcohols, including several hydrofluoroethers (HFEs), which could be updated through the WMO Scientific Assessments. These fluorinated ethers and alcohols are not required to be included in national GHG inventories reported under the UNFCCC. In general, the compounds required to be reported under the GHGRP go beyond the minimum reporting requirements of the UNFCCC (e.g., NF_3 or fluorinated heat transfer fluids). These compounds were included in Part 98 because they are long-lived in the atmosphere, have high GWPs, and, in many cases, are used in expanding industries or as substitutes for HFCs (see 74 FR 16464, April 10, 2009). Thus, adopting GWPs for these compounds from an international assessment that is more recent than the AR4 would not conflict with UNFCCC reporting.

The 2010 WMO Scientific Assessment includes significant updates to the GWPs for several HFEs in commerce, reflecting improved understanding of the atmospheric lifetimes and radiative efficiencies of these chemicals. In a number of cases, estimated 100-year GWPs for HFEs have approximately doubled; in one, (for HFE-338mmz1), the estimated 100-year GWP rose by over a factor of six, from 380 to 2570. (The changes to the estimated

GWPs of other fluorinated GHGs, such as the HFCs and PFCs, were far smaller.) To ensure consistency between the GHGRP and UNFCCC reporting, the EPA is not proposing to adopt GWPs from the 2010 WMO Scientific Assessment for chemicals other than fluorinated ethers and alcohols. However, the EPA requests comment on adopting GWPs from the 2010 WMO Scientific Assessment for a subset of chemicals, fluorinated ethers and alcohols, that are not reported under the Inventory.

We are not proposing to include GWPs for ozone-depleting substances controlled by the Montreal Protocol¹² and by Title VI of the CAA (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons) in Table A-1, although the IPCC AR4 includes updated GWPs for them. These controlled substances are specifically excluded from the definition of GHG, F-GHG, and F-HTF under Part 98 (and thus not required to be reported under Part 98), as these substances are already effectively reported under 40 CFR part 82. Furthermore, the reduction of these substances is controlled under the Montreal Protocol. The UNFCCC does not cover these substances or require reporting of these substances

¹² The Montreal Protocol on Substances that Deplete the Ozone Layer is an international treaty that controls and phases out various ozone-depleting substances including chlorofluorocarbons, hydrochlorofluorocarbons and halons. These compounds are regulated in the U.S. under Title VI of the CAA. The UNFCCC does not cover these substances, and instead defers their treatment to the Montreal Protocol.

by UNFCCC parties,¹³ so collecting data on these substances is unnecessary to complement or supplement the Inventory.

c. Proposed Additional F-GHGs and GWPs for Table A-1

We are proposing to include 26 new F-GHGs in Table A-1 of subpart A for which the EPA has identified scientific assessments of the GWPs. These F-GHGs were not included in AR4 for a variety of reasons.¹⁴ As discussed in Section II.A.1.a of this preamble, the F-GHGs we are proposing to include in Table A-1 are emitted or supplied by reporters under subparts I, L, T, OO, and QQ. Including GWP values in Table A-1 for these compounds would ensure that their atmospheric impacts are accurately reflected in annual reports, threshold determinations, or other calculations, as appropriate for each subpart in Part 98. In general, those F-GHGs whose GWPs are currently not listed in Table A-1 are not currently included in threshold calculations for applicability or in the CO₂e totals reported by facilities and suppliers¹⁵ (although they are currently reported in metric tons of substance emitted or supplied (40 CFR 98.3(c)(4))). Where their GWPs are low, these

¹³ Refer to: <http://www.unfccc.int>. See Article 4 of the Convention on Climate Change.

¹⁴ In some cases, the F-GHGs had not been developed or had not become commercially important in time for inclusion in AR4; in others, the F-GHGs were known to have short atmospheric lifetimes and/or low GWPs.

¹⁵ The one exception to this is F-GHGs reported under subpart L. Under a final rule published on August 24, 2012 (77 FR 51477), fluorinated gas producers are required for RY 2011 and RY 2012 to report total annual emissions in CO₂e and to use either default or best-estimate GWPs for fluorinated GHGs that do not have GWPs listed in Table A-1.

compounds may have little effect on facility CO₂e totals.

However, where their GWPs are high, they may have a large effect on those totals.

In some cases, the proposed additions to Table A-1 would help to ensure that all Part 98 facilities emitting or supplying the identified F-GHGs would use consistent GWPs to calculate emissions of CO₂e. For example, GWPs are used in 40 CFR 98.123(c)(1), a provision of subpart L of Part 98 (Fluorinated Gas Production), to determine the emission estimation method for continuous process vents.¹⁶ Under 40 CFR 98.123(c)(1)(v), subpart L reporters must use the GWPs in Table A-1 to convert F-GHG emissions to CO₂e for a preliminary estimate of emissions. For F-GHGs whose GWPs are not listed in Table A-1, subpart L reporters must use a default GWP of 2,000 unless they submit a request to use provisional GWPs for those F-GHGs following the requirements of 40 CFR 98.123(c)(1)(vi) and the EPA approves the request. Provisional GWPs may be used only in the calculations in 40 CFR 98.123(c)(1) and only by the facilities for which they

¹⁶ This is part of the provision of subpart L that allows facilities to request to use provisional GWPs to calculate a preliminary estimate of emissions from each process vent. If the preliminary estimate indicates that a vent emits 10,000 metric tons CO₂e or more, the subpart L reporter is required to use stack testing to establish an emission factor for the continuous process vent. If the preliminary estimate indicates that the vent emits less than 10,000 metric tons CO₂e, the subpart L reporter may use engineering calculations or assessments to develop an emission calculation factor.

have been approved.¹⁷ Therefore, although the EPA may have reviewed and substantiated provisional GWP values for select F-GHGs for certain producers to use in determining the emission estimation method for continuous process vents under subpart L, the provisional GWPs may not be used by other Part 98 facilities. Including the proposed F-GHGs in Table A-1 would reduce burden for facilities that may otherwise be required to perform stack testing based on the default GWP (e.g., if the default GWP overstates the radiative efficiency of the F-GHG). Additionally, including these F-GHGs in Table A-1 would provide more accurate reporting than the use of the default GWPs under subpart L.

The proposed F-GHGs include F-GHGs for which the EPA has previously reviewed scientific assessments from requests for provisional GWPs, F-GHGs submitted by a fluorinated GHG producer with suggested GWPs and supporting data and analysis on August 21, 2012, and F-GHGs for which evaluations of the GWPs were performed by the EPA (e.g., as part of evaluations associated with EPA's Significant New Alternative Policy (SNAP) program), or published in peer-reviewed scientific journals.¹⁸

¹⁷ For reporting years 2011 and 2012, subpart L reporters may use a best estimate of the GWP meeting the data requirements for provisional GWPs in 40 CFR 98.123(c)(1)(vi)(A)(3) as part of their facility-wide reported emissions.

¹⁸ The SNAP program is EPA's program to evaluate substitutes for the ozone-depleting substances that are being phased out under the stratospheric ozone protection provisions of the Clean Air Act (as implemented in 40 CFR part 82). As part of EPA's assessment of a substitute's overall risk to human

Specifically, the compounds we are proposing to add to Table A-1 of subpart A include:

- Seven compounds for which the EPA has approved provisional GWPs for purposes of the calculations in 40 CFR 98.123(c)(1). The EPA reviewed scientific assessments of the GWPs for these F-GHGs as provided with provisional GWP requests received from Honeywell International ("Honeywell") and DuPont de Nemours, Inc. ("DuPont") and published in the February 3, 2012 Notice of Data Availability (77 FR 5514). The EPA approved provisional GWPs for one F-GHG for Honeywell, and for six F-GHGs for DuPont. The EPA finalized its determinations for these compounds on February 24, 2012 (see Docket ID No. EPA-HQ-OAR-2009-0927-0273). Based on EPA's review of the GWP estimation methods for these compounds, we are proposing to amend Table A-1 to include these seven gases.
- Four compounds submitted with provisional GWP requests for which the EPA did not approve provisional GWPs (including three F-GHGs for DuPont, and one F-GHG for Honeywell). The companies submitted scientific data supporting the GWPs of these four compounds, which was made available in the February 3, 2012 Notice of Data Availability (77 FR 5514). (see Docket ID No. EPA-HQ-OAR-2009-0927-0256 for further discussion of the scientific assessments reviewed). The EPA did evaluate the GWPs of these F-GHGs, but not for the purposes of the calculations in 40 CFR 98.123(c) because the calculated emission rates of these chemicals, when using the default GWP, did not exceed the 10,000 metric tons CO₂e threshold and did not meet the conditions of 40 CFR 98.123(c)(1)(v). The fact that the EPA did not approve the GWPs for purposes of the calculations in 40 CFR 98.123(c)(1) was not due to disagreement with the companies' suggested GWPs. Therefore, the EPA is also proposing to amend Table A-1 to include these four gases.
- Ten F-GHGs submitted by DuPont on August 21, 2012, with supporting data and analysis (see Table 3 of this preamble). We are proposing to include the ten compounds in Table A-1. For each compound, DuPont included peer-reviewed scientific data supporting the suggested GWP.

health and the environment, the EPA reviews scientific assessments of the GWP and considers this, among other criteria, in evaluating a substitute.

- Five F-GHGs which were identified from the EPA's review of industrial gases produced for or used in the electronics manufacturing, fluorinated gas production, magnesium production, electrical equipment manufacture or refurbishment, and industrial gas supplier source categories and for which scientific assessments or other documentation of the GWPs were identified through the EPA's SNAP Program or peer-reviewed literature. These compounds are identified under the common names FK-5-1-12 (Novec™ 612), FK-6-1-12 (Novec™ 774), trans-1-chloro-3,3,3-trifluoroprop-1-ene, PFC-6-1-12, and PFC-7-1-18.

Determination of proposed GWPs. To determine the proposed GWPs for each compound, the EPA reviewed the scientific literature for each compound and evaluated the accuracy of the estimation methods and assumptions used to derive the GWP.¹⁹ A detailed description of the EPA's analysis may be found in the memorandum, "GWP Determinations for Proposed Additional F-GHGs for Table A-1", Docket ID No EPA-HQ-OAR-2012-0934. The proposed GWP for each of the 26 compounds is included in Table 3 of this preamble; Table 3 also includes how each compound was identified for inclusion in Table A-1 of subpart A.

¹⁹ The key component of the GWP calculation is the time-integrated radiative forcing of a one-kg emission of the compound over a 100-year time horizon. The accuracy of the radiative forcing calculation depends on the accuracies of the infrared absorption spectrum and the atmospheric lifetime of the compound. The lifetime is affected by the compound's reaction rates through reaction with atmospheric oxidants (e.g., ozone or hydroxyl radicals) or through photolysis (destruction by light). These rates, as well as the radiative efficiency of the compound, depend on the distribution of the compound in the atmosphere with altitude, latitude and longitude. The factors affecting GWPs are discussed in more detail in Supporting Analysis for Mandatory Reporting Of Greenhouse Gases: Notice Of Preliminary Determinations Regarding Requests to Use Provisional Global Warming Potentials Under the Fluorinated Gas Production Category of the Greenhouse Gas Reporting Rule (January 23, 2011), which is available in Docket EPA-HQ-OAR-2012-0934.

Table 3. Proposed F-GHGs with GWPs for Table A-1.

Chemical Designation or Common Name	CAS No.	Chemical Formula	Pro- posed GWP	Origin of Compound and GWP Assessments
HFC-1234ze (E)	29118-24-9	$C_3H_2F_4$	6	Approved as provisional GWP for Honeywell International (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
hexafluoropropylene (HFP)	116-15-4	C_3F_6	0.25	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
perfluoromethyl vinyl ether (PMVE)	1187-93-5	$CF(CF_3)OCF_3$	3	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
tetrafluoroethylene (TFE)	116-14-3	C_2F_4	0.02	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
trifluoro propene (TFP)	677-21-4	$C_3H_3F_3$	3	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
vinyl fluoride (VF)	75-02-5	C_2H_3F	0.7	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
vinylidene Fluoride (VF2)	75-38-7	$C_2H_2F_2$	0.9	Approved as provisional GWP for DuPont de Nemours (see EPA-HQ-OAR-2009-0927-0273, February 24, 2012)
carbonyl fluoride	353-50-4	COF_2	2	Submitted with provisional GWP request for DuPont de Nemours, no provisional GWP approved (see EPA-HQ-OAR-2009-0927-

Chemical Designation or Common Name	CAS No.	Chemical Formula	Pro- posed GWP	Origin of Compound and GWP Assessments
				0273, February 24, 2012)
perfluoropropyl vinyl ether	1623- 05-8	C ₅ F ₁₀ O	3	Submitted with provisional GWP request for DuPont de Nemours, no provisional GWP approved (see EPA- HQ-OAR-2009-0927- 0273, February 24, 2012)
perfluoroethyl vinyl ether	10493- 43-3	C ₄ F ₈ O	3	Submitted with provisional GWP request for DuPont de Nemours, no provisional GWP approved (see EPA- HQ-OAR-2009-0927- 0273, February 24, 2012)
HFC-1234yf	754-12- 1	C ₃ H ₂ F ₄	4	Submitted with provisional GWP request for Honeywell International, no provisional GWP approved (see EPA- HQ-OAR-2009-0927- 0273, February 24, 2012)
perfluoroethyl iodide (2-I)	354-64- 3	C ₂ F ₅ I	3	Submitted in August 2012 by DuPont de Nemours
perfluorobutyl iodide (PFBI, 42-I)	423-39- 2	C ₄ F ₉ I	3	Submitted in August 2012 by DuPont de Nemours
perfluorohexyl iodide (6-I)	355-43- 1	CF ₃ CF ₂ CF ₂ CF 2CF ₂ CF ₂ IC ₆ F 13I	2	Submitted in August 2012 by DuPont de Nemours
perfluorooctyl iodide (8-I)	507-63- 1	C ₈ F ₁₇ I	2	Submitted in August 2012 by DuPont de Nemours
1,1,1,2,2- pentafluoro-4-iodo butane (22-I)	40723- 80-6	C ₄ H ₄ F ₅ I	2	Submitted in August 2012 by DuPont de Nemours
1,1,1,2,2,3,3,4,4- nonafluoro-6-iodo hexane (42-I)	2043- 55-2	C ₆ H ₄ F ₉ I	2	Submitted in August 2012 by DuPont de Nemours
perfluorobutyl ethene	19430-	C ₆ H ₃ F ₉	2	Submitted in August

Chemical Designation or Common Name	CAS No.	Chemical Formula	Pro- posed GWP	Origin of Compound and GWP Assessments
(42-U)	93-4			2012 by DuPont de Nemours
perfluorohexyl ethene (62-U)	25291- 17-2	C ₈ H ₃ F ₁₃	1	Submitted in August 2012 by DuPont de Nemours
perfluorooctyl ethene (82-U);	21652- 58-4	C ₁₀ H ₃ F ₁₇	1	Submitted in August 2012 by DuPont de Nemours
1H,1H, 2H,2H- perfluorohexan-1-ol (42-AL)	2043- 47-2	C ₆ H ₅ F ₉ O	5	Submitted in August 2012 by DuPont de Nemours
FK-5-1-12; Novec™ 612; FK-5-1-12myy2; n-Perfluorooctane; Octadecafluorooctan e	756-13- 8	CF ₃ CF ₂ C(O)C F(CF ₃) ₂	1.8	Published under EPA's SNAP Program (40 CFR part 82) and identified in manufacturer's literature
FK-6-1-12/Novec™ 774, C7 Fluoroketone	813-44- 5 and 813-45- 6	C ₇ F ₁₄ O Chemical Blend	1	Published under EPA's SNAP Program (40 CFR part 82)
trans-1-chloro-3,3,3- trifluoroprop-1-ene	2730- 43-0	C ₃ H ₂ ClF ₃	7	Published under EPA's SNAP Program (40 CFR part 82) and identified in peer reviewed literature
PFC-6-1-16; Hexadecafluoroheptane	335-57- 9	C ₇ F ₁₆	7930	Identified in peer reviewed literature
PFC-7-1-18; Octadecafluorooctane	307-34- 6	C ₈ F ₁₈	8340	Identified in peer reviewed literature

For the first 11 compounds in Table 3 (seven with approved provisional GWPs and the four without approved provisional GWPs), the EPA determined that the methods used to estimate the GWPs were likely to overestimate the GWPs by an order of magnitude or more (see Docket ID No. EPA-HQ-OAR-2009-0927-0256). These compounds are all relatively short-lived, and the analyses to determine the GWP for these compounds used the simplifying assumptions that the compounds are well-mixed in the atmosphere. In general, the assumption that short-lived compounds are well-

mixed overestimates the radiative forcing of these gases and may affect estimates of the atmospheric lifetime. Because of this simplifying assumption, the proposed GWPs are likely to be overestimates. However, the EPA has determined that the proposed GWPs for these short-lived gases represent the most current, peer-reviewed, scientific knowledge of the radiative properties and lifetimes of these gases. For subpart L reporters, the proposed GWPs would provide a more accurate calculation of CO₂e emissions than the default GWPs required under 40 CFR 98.123(a). Furthermore, because the GWP of each of these 11 F-GHGs is very low (i.e., between 0.02 and 6, as shown in Table 3 of this preamble), the EPA has determined that the proposed GWPs would not significantly overestimate source category emissions or supply and are acceptable for the purposes of calculating emissions under Part 98.

For the ten F-GHGs submitted by DuPont on August 21, 2012, the radiative efficiency of each compound is derived using a constant mixing ratio of the compounds in the troposphere (i.e., the methods assume that the compounds are well-mixed). These compounds are all anticipated to be short-lived in the atmosphere. Therefore, the constant mixing ratio likely overestimates the share of these compounds that reside higher in the atmosphere and consequently overestimates the radiative efficiency (and GWP). For four of the 10 compounds, the approach

used to calculate the atmospheric lifetimes likely underestimates the lifetimes of these compounds.²⁰ However, the radiative efficiency calculation is likely to outweigh the underestimated lifetimes. The EPA reviewed recent research that suggests the approach used to determine the radiative efficiency for these compounds can result in overestimates of the 100-year GWP of 49 to 233 percent (see "GWP Determinations for Proposed Additional F-GHGs for Table A-1," Docket ID No EPA-HQ-OAR-2012-0934 for additional information on this analysis). The available estimates for these GWPs are likely upper bounds, because these are short-lived, low-GWP gases. We are proposing to include the GWPs for these ten F-GHGs in Table A-1 of subpart A. Because the GWP of each F-GHG is very low (i.e., between 1 and 5, as shown in Table 3), the EPA has determined that the proposed GWPs would not significantly overestimate source category emissions or supply and are acceptable for the purposes of calculating emissions under Part 98.

For the five F-GHGs identified through scientific assessments published through EPA's SNAP program or in peer-reviewed literature, the EPA evaluated the estimation methods used to determine the GWP for each compound. The EPA's

²⁰ The methods used assumed that these gases were well-mixed; this underestimates the concentration of O₃ and overestimates the concentration of OH to which the compound is actually exposed. The overestimate of the OH concentration has a greater effect on the reaction rate and estimated lifetime of the compound.

determination for each compound (identified by common name) and the proposed GWPs are as follows:

- FK-5-1-12 (Novec™ 612, Novec™ 1230). FK-5-1-12 is a fluorinated ketone; it is known under the trade name Novec™ 612 when used as a magnesium cover gas and as Novec™ 1230 when used as a fire suppression agent. Product information provided by the manufacturer provides a GWP estimate of 1 for a 100-year integration using IPCC 2007 calculation methods.²¹ An analysis of the GWP of FK-5-1-12 was also performed through EPA's SNAP Program.²² The SNAP analysis considered two scientific reports that provided estimates of atmospheric lifetime and radiative efficiency, and determined that the total GWP of FK-5-1-12 (integrated over a 100-year time horizon and calculated using the IPCC approach) would likely have a value between 0.6 and 1.8. The total GWP comprises a direct value of less than 1 but greater than zero plus an indirect GWP of 0.56 to 0.84, based on 4 to 6 carbons available for conversion to CO₂. The EPA is conservatively proposing a GWP of 1.8. For the upper-bound value, the methods used to evaluate the radiative efficiency for FK-5-1-12 assumed a constant mixing ratio for the compound, which likely overestimated the radiative efficiency and the GWP. Because the proposed GWP of the compound is so low, we do not anticipate that the proposed value would result in substantial over-reporting for the magnesium production source category.
- FK-6-1-12 (Novec™ 774, C7 Fluoroketone). The compound FK-6-1-12 (also produced under the trade name Novec™ 774), is a blend of two isomers: 3-pentanone,1,1,1,2,4,5,5,5-octafluoro-2,4-bis(trifluoromethyl) and 3-hexanone,1,1,1,2,4,4,5,5,6,6,6-undecafluoro-2-(trifluoromethyl). The GWP of FK-6-1-12 was previously evaluated and published under EPA's SNAP Program.²³ The SNAP analysis provided a 100-year integrated GWP of approximately 1, therefore, we are proposing to include a GWP value of 1 in Table A-1. The compound also has a chemical structure similar to that of FK-5-1-12, therefore,

²¹ 3M Company. "3M™ Novec™ 1230 Fire Protection Fluid." 2009. Available online at: http://multimedia.3m.com/mws/mediawebserver?mwsId=66666UF6EVsSyXTtlXfyn8TEEVtQEVs6EVs6EVs6E6666666--&fn=prodinfo_novec1230.pdf.

²² See Docket ID No. EPA-HQ-OAR-2012-0934.

²³ See "Protection of Stratospheric Ozone: Determination 27 for Significant New Alternatives Policy Program," Docket ID No. EPA-HQ-OAR-2012-0934.

we anticipate a similar lifetime and GWP for these compounds.

- trans-1-chloro-3,3,3-trifluoroprop-1-ene. The compound trans-1-chloro-3,3,3-trifluoroprop-1-ene (trade name Solstice™ 1233zd(E)) is a polyurethane foam blowing agent useful in applications such as thermal insulation in appliances and residential and commercial buildings. An analysis of the GWP of trans-1-chloro-3,3,3-trifluoroprop-1-ene was previously performed through EPA's SNAP Program.²⁴ As part of the SNAP analysis, the EPA considered two studies, Anderson et al. (2008)²⁵ and Wang et al. (2011),²⁶ and established a GWP of between 4.7 and 7 and an atmospheric lifetime of approximately 26 to 31 days. In its evaluation, the EPA has given weight to the peer-reviewed analysis by Anderson et al. (2008), which calculates a GWP of 7. We are also considering research by Wang et al. (In draft)²⁷ which calculates a lifetime of 30.5 days and estimates a GWP of 4.7. The model used by Wang et al. accounts for the shorter lifetime and reduced mixing of the trans-1-chloro-3,3,3-trifluoroprop-1-ene compound, and may provide a more accurate estimate of the GWP. Although the latter two of the studies cited (from the same author) give a GWP of 4.7, the EPA has determined that it is more appropriate to use the GWP from the first study, as it comes from a peer-reviewed journal article. Also, consistent with the reasoning for choosing possibly upper-bound GWPs for other chemicals in Table 3 of this preamble, the EPA has concluded that using the GWP of 7 rather than 4.7 would not significantly overestimate source category

²⁴ See "Protection of Stratospheric Ozone: Determination 27 for Significant New Alternatives Policy Program," Docket ID No. EPA-HQ-OAR-2012-0934.

²⁵ Andersen, M.P.S., E.J.K. Nilsson, O.J. Nielsen, M.S. Johnson, M.D. Hurley, and T.J. Wallington. 2008. Atmospheric chemistry of trans-CF₃CHCHCl: Kinetics of the gas-phase reactions with Cl atoms, OH radicals, and O₃. J. Photochem. Photobiol. A: Chemistry 199: 92-97.

²⁶ Wang D., Olsen S., Wuebbles D. 2011. "Preliminary Report: Analyses of tCFP's Potential Impact on Atmospheric Ozone." Department of Atmospheric Sciences. University of Illinois, Urbana, IL. September 26, 2011.

²⁷ Wang, D., Wuebbles, D.J., Patten, K.O., and Olsen, S.C. In draft. Climate advantages of proposed short-lived compounds as replacements for longer-lived HCFCs and HFCs. Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, Urbana, Illinois. Draft report, undated.

emissions or supply and is acceptable for the purposes of calculating emissions under Part 98.

- PFC 6-1-16 and PFC 7-1-18. The perfluorocarbons (PFCs) C_7F_{16} and C_8F_{18} are used as heat transfer fluids and in vapor phase reflow soldering in the electronics manufacturing industry. There are no previous estimates of the GWPs for these gases. Ivy et al. (2012)²⁸ have recently provided emission estimates and measured infrared spectra of these PFCs to estimate the GWPs. These compounds have an estimated atmospheric lifetime of 3,000 years and are expected to be well-mixed in the atmosphere. Because the expected lifetimes of these PFCs are much longer than the 100-year time horizon used to calculate the GWP, they are relatively insensitive to the estimated lifetime. Furthermore, the methods and assumptions used by Ivy et al. (2012) are generally considered reliable for long-lived gases. Therefore, we are proposing the GWPs for these two compounds as presented by Ivy et al., as listed in Table 3 of this preamble.

A complete analysis of each of these compounds and the proposed GWPs are included in the memorandum, "GWP Determinations for Proposed Additional F-GHGs for Table A-1," Docket ID No. EPA-HQ-OAR-2012-0934.

Request for additional information. The GWPs we are proposing in Table A-1 are based on the data available to the EPA at the time of this proposed rulemaking. We specifically solicit comment on the proposed GWPs for the 26 compounds we are proposing in Table A-1, including submittal of additional data or analyses that may support more accurate estimates of the GWP

²⁸ Ivy, D.J., M. Rigby, M. Baasandorj, J. B. Burkholder, and R. G. Prinn. 2012. Global emission estimates and radiative impact of C_4F_{10} , C_5F_{12} , C_6F_{14} , C_7F_{16} and C_8F_{18} . Atmos. Chem. Phys., 12: 7635-7645. DOI:10.5194/acp-12-7635-2012.

or that support the GWP estimation methods that are currently provided.

For commenters providing new estimates of GWPs for the proposed compounds for inclusion in Table A-1, we request that the commenter submit the following types of scientific data and analyses to support the estimated GWP:

(1) Data and analysis related to the low-pressure gas phase infrared absorption spectrum of the compound;

(2) Data and analysis related to reaction mechanisms and rates such as photolysis and reaction with atmospheric components such as hydroxyl radicals (OH), ozone (O₃), carbon monoxide (CO), and water;

(3) Radiative transfer analyses that integrate the lifetime and infrared absorption spectrum data to calculate the GWP; or,

(4) Published or unpublished studies of the GWP of the compound.

The EPA intends to review and consider additional information submitted during the public comment period to assess the proposed GWPs and consider other accurate estimates of the GWP for each compound. We anticipate requesting comment on additional compounds in a separate action.

2. Other Technical Corrections and Proposed Amendments to Subpart A

In addition to the proposed amendments to global warming potentials in Table A-1, we are also proposing corrections and other clarifications to certain provisions of subpart A of Part 98. The more substantive corrections, clarifying, and other amendments to subpart A are found here. Additional minor corrections are discussed in the Table of Revisions to this rulemaking (see Docket ID No. EPA-HQ-OAR-2012-0934).

The EPA is proposing to revise the reporting requirements of 40 CFR 98.3(c)(1). Section 98.3(c)(1) requires reporting of the physical address of the facility where the emissions occur (not the parent company address). Some facilities do not have a physical street address assigned to them and their mailing address is not co-located with their facility operations. In order to more accurately report the physical location of these facilities, the EPA is proposing that those without a physical address at their operations site provide latitude and longitude coordinates instead. This proposed addition is not intended as an option for any facility whose physical address coincides with their facility operations. It also is not intended for use by suppliers and importers and/or exporters covered by Part 98, or facilities reporting under subpart W in the natural gas distribution (40 CFR 98.230(a)(8)) or onshore petroleum and natural gas production (40 CFR 98.230(a)(2)) industry segments.

We are proposing to add a requirement to 40 CFR 98.3(c)(13) for all facilities with a power generating unit to report the facility Office of the Regulatory Information System (ORIS) code for each power generation unit. The proposed amendment would facilitate the verification of emissions information received by the EPA. The EPA is also proposing to add the following definition for ORIS code in 40 CFR 98.6 for clarity, "ORIS Code" means the unique identifier assigned to each power plant in the National Electric Energy Data System (NEEDS). The ORIS code is a four digit number assigned by the Energy Information Administration (EIA) at the U.S. Department of Energy to power plants owned by utilities."

We are proposing to add a provision to 40 CFR 98.3(c)(11) to include instructions for the reporting of a United States parent company legal name and address. The proposed amendment would specify that a facility or supplier must use the reporting instructions found in e-GGRT when reporting a parent company. The proposed amendment would facilitate verification of the emissions reported by allowing the EPA to provide a common naming convention through e-GGRT that would be used to easily identify parent companies and to accurately attribute GHG emissions to the correct parent companies. Instructions regarding reporting of parent company name and address have been

posted to the docket for this action (See docket ID no. EPA-HQ-OAR-2012-0934) .

Additionally, we are proposing to amend 40 CFR 98.3(h) (4) to clarify the provisions for requesting an extension of the 45-day period for submission of revised reports in 40 CFR 98.3(h) (1) and (2). Specifically, we are clarifying the timing requirements for approval or denial of the automatic 30-day extension and any subsequent extensions provided in 40 CFR 98.3(h) (4). The proposed amendments would require reporters to submit a request for any additional extension beyond the 30-day automatic extension at least 5 business days prior to the expiration of the initial 30-day extension. If the request demonstrates that it is not practicable to submit the data or information needed to resolve a potential reporting error following the 30-day automatic extension, the Administrator may approve an additional extension request. The proposed amendment would provide a reasonable timeline for reporters to submit extension requests and for the EPA's collection and verification of reported data.

We are proposing to add a definition of fluidized bed combustor (FBC) to 40 CFR 98.6. The definition is necessary to be consistent with the proposed addition of FBC-specific N₂O emission factors for coal, waste anthracite (culm), and waste bituminous (gob) to Table C-2.

Finally, we are proposing revisions to the definitions of three terms in subpart A: degasification system, ventilation well or shaft, and ventilation system. These terms are used only in subpart FF, Underground Coal Mines, and are proposed to be revised to more closely align with common terminology used in the coal mining industry.

B. Subpart C – General Stationary Fuel Combustion Sources

We are proposing revisions to the requirements of 40 CFR part 98, subpart C (General Stationary Fuel Combustion Sources) to clarify the use of the Tier methodologies and to update high heat value (HHV) and emission factors. The more substantive corrections, clarifying, and other amendments to subpart C are found here. Additional minor corrections are discussed in the Table of Revisions to this rulemaking (see Docket ID No. EPA-HQ-OAR-2012-0934).

First, we are proposing to amend 40 CFR 98.33(b)(1) to expand the use of the Tier 1 methodology in one situation that currently requires the use of the Tier 3 methodology. Generally, subpart C requires the use of the Tier 3 methodology for combustion units that are greater than 250 million Btus per hour for all fuels listed in Table C-1, and, for fuels not listed in Table C-1 if the fuel provides 10 percent or more of the annual heat input to the unit. To reduce the monitoring burden of determining carbon content of Table C-1 fuels that are used in

relatively small amounts annually, we are proposing a change to 40 CFR 98.33(b)(1) that will allow the Tier 1 methodology to be used for Table C-1 fuels that are combusted in a unit with a maximum rated heat input capacity greater than 250 million Btus per hour, if the fuel provides less than 10 percent of the annual heat input to the unit.

We are proposing changes to Table C-1 to update the HHV and emission factors for several fuels and to add emission factors for culm and gob. The EPA received a number of comments and questions through the GHGRP Help Desk with suggestions for improvements to these factors. We researched these factors to ensure the most scientifically valid values were reflected. An analysis of the proposed changes to Table C-1 as a result of this research can be found in the memorandum "Review and Evaluation of 40 CFR Part 98 CO₂ Emission Factors for EPW07072 TO 45," available in Docket ID No. EPA-HQ-OAR-2012-0934.

In response to a Petition for Rulemaking ("Sierra Club Petition")²⁹, the EPA evaluated establishing separate (from the parent coal) CO₂ emission factors for culm and gob in Table C-1. The EPA is proposing the addition of culm and gob to Table C-1. These separate entries have been added to clarify that the Table

²⁹ Letter from Craig Holt Segall, Sierra Club Environmental Law Program, on behalf of the Sierra Club, Center for Biological Diversity, Clean Air Task Force, Clean Wisconsin, the Kentucky Environmental Foundation, the Minnesota Center for Environmental Advocacy, and the Natural Resources Defense Council to Lisa Jackson, U.S. EPA. Petition for Rulemaking To Correct Emission Factors in the Mandatory Greenhouse Gas Reporting Rule. October 28, 2010.

C-1 CO₂ emission factors for anthracite coal and bituminous coal should be used for culm and gob, respectively. Because the heating value of culm or gob is variable and quite different from the parent anthracite or bituminous coals, the EPA is proposing that the default heating values in Table C-1 for anthracite and bituminous may not be used for culm and gob. The changes to Table C-1 specify that the HHV for culm or gob must be measured according to the Tier 2 Methodology. Our analysis and development of emission factors can be found in the memorandum "Emission Factor Updates for Fluidized Bed Boilers and Other Revisions to Tables C-1 and C-2 of 40 CFR Part 98 - Summary" available in Docket Id. No. EPA-HQ-OAR-2012-0934. Because the Tier 1 Methodology allows the use of default HHVs from Table C-1, we propose revising 40 CFR 98.33(b)(1) to prohibit use of the Tier 1 Methodology when estimating the emissions from combustion of culm or gob. With these revisions and those proposed with respect to fluidized bed combustors in this Section II.B., *infra*, we believe that we have fully addressed the Petition for Rulemaking.

Table 4 of this preamble shows a summary of the proposed Table C-1 revisions, and major changes are explained below.

Table 4. Proposed Changes to Table C-1 to Subpart C—Default CO₂ Emission Factors and High Heat Values for Various Types of Fuel

	Current values	Proposed values
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Fuel type	Default high heat value	Default CO ₂ emission factor	Default high heat value	Default CO ₂ emission factor
Coal and coke	mmBtu/short ton	kg CO ₂ /mmBtu		
Anthracite	25.09	103.54	No change	103.69
Waste Anthracite (Culm)			See footnote 1	103.69
Bituminous	24.93	93.40	No change	93.28
Waste Bituminous (Gob)			See footnote 1	93.28
Subbituminous	17.25	97.02	No change	97.17
Lignite	14.21	96.36	No change	97.72
Coal Coke [Fuel type changed from "coke"]	24.80	102.04	No change	113.67
Mixed (Commercial sector)	21.39	95.26	No change	94.27
Mixed (Industrial coking)	26.28	93.65	No change	93.90
Mixed (Industrial sector)	22.35	93.91	No change	94.67
Mixed (Electric Power sector)	19.73	94.38	No change	95.52
Natural gas	mmBtu/scf	kg CO ₂ /mmBtu		
(Weighted U.S. Average)	1.028×10^{-3}	53.02	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO ₂ /mmBtu		
Used Oil	0.135	74.00	0.138	No change
Liquefied petroleum gases (LPG)	0.092	62.98	No change	61.71
Propane	0.091	61.46	No change	62.87
Propylene	0.091	65.95	No change	67.77
Ethane	0.069	62.64	0.068	59.60

	Current values		Proposed values	
Fuel type	Default high heat value	Default CO ₂ emission factor	Default high heat value	Default CO ₂ emission factor
Ethylene	0.100	67.43	0.058	65.96
Isobutane	0.097	64.91	0.099	64.94
Isobutylene	0.103	67.74	No change	68.86
Butane	0.101	65.15	0.103	64.77
Butylene	0.103	67.73	0.105	68.72
Natural Gasoline	0.110	66.83	No change	66.88
Petrochemical Feedstocks	0.129	70.97	0.125	71.02
Unfinished Oils	0.139	74.49	No change	74.54
Heavy Gas Oils	0.148	74.92	No change	No change
Crude Oil	0.138	74.49	No change	74.54
Other fuels-solid	mmBtu/short ton	kg CO ₂ /mmBtu		
Tires	26.87	85.97	28.00	No change
Biomass fuels-solid	mmBtu/short ton	kg CO ₂ /mmBtu		
Wood and Wood Residuals(dry basis) [Fuel Type description changed from Wood and Wood Residuals]	15.38	93.80	17.48	No change
Solid Byproducts	25.83	105.51	10.39	No change
Biomass fuels-gaseous	mmBtu/scf	kg CO ₂ /mmBtu		
Landfill Gas [Fuel type description changed from Biogas (captured methane)]	0.841×10^{-3}	52.07	0.485×10^{-3}	No change
Other Biomass Gases [New Fuel type added]			0.655×10^{-3}	52.07

Fuel type	Current values		Proposed values	
	Default high heat value	Default CO ₂ emission factor	Default high heat value	Default CO ₂ emission factor
Biomass Fuels—Liquid	mmBtu/gallon	kg CO ₂ /mmBtu		
Biodiesel	0.128	73.84	Deleted Duplicate	

Note: "No change" indicates no changes to the current value. Additional footnotes have been added to the table.

The changes include a change to the HHV for wood and wood residuals. The HHV in Table C-1 for Wood and Wood Residuals is a wet basis value that assumes a moisture content of 12 percent. GHGRP reporters have indicated that they use wood fuel with highly variable moisture content, and so the existing factor results in calculation inaccuracies of CO₂ emissions from burning this fuel. These reporters have requested that the EPA provide HHVs for a range of moisture contents for wood fuel. In order to address this issue, we are proposing an addition to Table C-1 for "Wood and Wood Residuals on a dry basis," with a footnote containing an equation that can be used to adjust the value for any moisture content. Reporters can then calculate a HHV for use in Equation C-1 using the moisture content of their facility specific fuel. We are also proposing a change to Table C-1 that replaces the one HHV for "Biogas (captured methane)" with values for two types of biogas: "Landfill Gas" and "Other Biomass Gases." The CH₄ content of landfill gas (approximately

50 percent) is typically lower than the CH₄ concentration in digester gas (approximately 65 percent), and the proposed emission factors reflect these concentration values.

Revisions are proposed to the HHV and emission factors for the individual components of liquid petroleum gases (LPG) including propane, propylene, ethane, ethylene, isobutane, isobutylene, butane, and butylene. Since the HHV for these LPGs are presented on the basis of million Btu per gallon, and these compounds are gases under standard conditions, the heating value must be presented using a stated temperature and pressure. For all LPG except ethylene, we are proposing estimates of HHV at 60 degrees Fahrenheit (°F) and saturation pressure. For ethylene, since it cannot be liquefied above 48.6°F, we have selected a value for HHV that is determined at 41°F (slightly under the critical temperature) and the corresponding saturation pressure. The emission factors for these compounds have also been updated using the proposed HHV and the fraction of carbon contained in the compound.

We are proposing a correction to the emission factor for coke because it appears that the emission factor currently in Table C-1 was inadvertently listed as the emission factor for petroleum coke. We have also changed the name in Table C-1 to "coal coke" to differentiate this substance from "petroleum coke", which has a different HHV and EF. We are also proposing

updated emission factors for the four types of coal and the four listed factors for mixed coals based on the most recent version of the factors used in the Inventory.

The HHV for the biomass fuel "solid byproducts" would be revised to reflect the average of the solid byproducts consumed by the facilities that reported HHV in the 1999 survey conducted by the Energy Information Administration. The proposed value is presented on a wet basis, and is more consistent with other biomass fuels. Based on our research, we are also proposing minor changes to the HHV and/or emission factors for the following substances: natural gas, used oil, petrochemical feedstocks, and tires. Other proposed changes to Table C-1 include updates to emission factors and HHV based on our latest research and to standardize conversion factors. These corrections are discussed in the memorandum "Review and Evaluation of 40 CFR Part 98 CO₂ Emission Factors for EPW07072 TO 45" (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are also proposing to revise 40 CFR 98.33(e)(3)(iv). The method in 40 CFR 98.33(e)(3)(iv) for calculating biogenic CO₂ emissions from municipal solid waste (MSW) combustion requires the use of a default factor for the biogenic share of CO₂. We are proposing a change to the default factor used to determine the annual biogenic CO₂ emissions from MSW from 0.6 to 0.55 to

reflect trends in waste composition. The complete analysis of this change can be found in the memorandum "Review and Evaluation of 40 CFR Part 98 CO₂ Emission Factors for EPW07072 TO 45", available in Docket ID No. EPA-HQ-OAR-2012-0934.

The EPA received a Petition for Reconsideration and Rulemaking from the American Forest & Paper Association (AF&PA) and the American Wood Council (AWC) on November 16, 2012 (hereafter referred to as "AF&PA Petition").³⁰ The AF&PA Petition included a recent study containing new methane (CH₄) and nitrous oxide (N₂O) emissions test data in support of a request that EPA revise the CH₄ and N₂O emission factors in Subparts AA and C for combustion of spent pulping liquor and wood residuals. The EPA reviewed the basis for the current emission factors, integrated the emissions test data provided by Petitioners with previously available data, and is proposing to update the spent pulping liquor and wood residual combustion emission factors in subparts AA and C, respectively.

Table 5 of this preamble summarizes the proposed Table C-2 revisions, and major changes are explained below.

³⁰ Letter from Paul Noe, American Forest & Paper Association, and Robert Glowinski, American Wood Council, to Lisa Jackson, U.S. EPA. Petition for Reconsideration of 40 C.F.R. Part 98 Subparts C and AA; Petition for Rulemaking To Revise 40 C.F.R. Part 98 Subparts C and AA; Request for Correction Under Information Quality Act. November 16, 2012.

Table 5. Proposed Changes to Table C-2 to Subpart C—Default CH₄ and N₂O Emission Factors for Various Types of Fuel

Fuel type	Current values		Proposed values	
	Default CH ₄ emission factor	Default N ₂ O emission factor	Default CH ₄ emission factor	Default N ₂ O emission factor
Coal and Coke (All fuel types in Table C-1) ¹ (Footnote Added)	1.1×10^{-02}	1.6×10^{-03}	1.1×10^{-02}	1.6×10^{-03}
Anthracite for FBCs only ²	N/A	N/A	1.1×10^{-02}	1.6×10^{-01}
Waste Anthracite (Culm) for FBCs only ²	N/A	N/A	1.1×10^{-02}	4.0×10^{-01}
Bituminous for FBCs only ²	N/A	N/A	1.1×10^{-02}	1.3×10^{-01}
Waste Bituminous (Gob) for FBCs only ²	N/A	N/A	1.1×10^{-02}	2.9×10^{-01}
Subbituminous for FBCs only ²	N/A	N/A	1.1×10^{-02}	6.5×10^{-02}
Lignite for FBCs only ²	N/A	N/A	1.1×10^{-02}	1.1×10^{-01}
Fuel Gas	N/A	N/A	3.0×10^{-03}	6.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals) (Added to parenthetical: "except wood and wood residuals")	3.2×10^{-02}	4.2×10^{-03}	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals			7.2×10^{-3}	3.6×10^{-3}
Biomass Fuels—Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}	3.2×10^{-03}	6.3×10^{-04}

	Current values		Proposed values	
Fuel type	Default CH ₄ emission factor	Default N ₂ O emission factor	Default CH ₄ emission factor	Default N ₂ O emission factor
Changed category from "Biomass"				

N/A = No current emission factor available.

¹Use of the default emission factors for the coal and coke category may not be used to estimate emissions from combusting anthracite, waste anthracite, bituminous, waste bituminous, subbituminous, or lignite coal burned in an FBC.

²Use of these default emission factors is required for FBCs burning the specified coal type.

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH₄/mmBtu.

Specifically, based on our analysis of this emissions test data, we are proposing to add a row for wood and wood residuals in Table C-2 that contains CH₄ and N₂O emission factors addressing those submitted to EPA with the AF&PA Petition. We integrated that data with previously available emissions test data in order to consider all of the information available to us in developing the new default emission factors for wood and wood residuals. Our analysis of the test data can be found in the memorandum "Kraft Pulping Liquor and Woody Biomass Methane (CH₄) and Nitrous Oxide (N₂O) Emission Factor Literature Review" available in Docket Id. No. EPA-HQ-OAR-2012-0934.

We are also proposing to add coal, culm, and gob N₂O emission factors to Table C-2 specific to fluidized bed

combustors. As referenced above in response to the Sierra Club Petition, the EPA reviewed multiple studies that indicate that N₂O emissions from fluidized bed combustors burning coal, culm, and gob are significantly higher than from conventional combustion technologies. The EPA agrees our analysis and development of emission factors (including a discussion of emission factors for culm and gob) can be found in the memorandum "Emission Factor Updates for Fluidized Bed Boilers and Other Revisions to Tables C-1 and C-2 of 40 CFR Part 98 - Summary" available in Docket Id. No. EPA-HQ-OAR-2012-0934.

We are proposing to add "fuel gas" to Table C-2 of subpart C to address a program gap discovered through the verification process. Because fuel gas is not currently included in Table C-2, instructions are included in subparts X and Y to use the default CH₄ and N₂O emission factors for "Petroleum (All fuel types in Table C-1)" to calculate CH₄ and N₂O emissions from fuel gas combustion. However, for facilities that do not report under subpart X or Y, there is currently no requirement to calculate CH₄ and N₂O emissions from fuel gas combustion. The proposed revision addresses this unintentional gap. As a result, subpart C reporters would be required to report CH₄ and N₂O emissions from fuel gas combustion. Fuel gas is defined at 40 CFR 98.6 as "gas generated at a petroleum refinery or

petrochemical plant and that is combusted separately or in any combination with any type of gas."

C. Subpart H – Cement Production

We are proposing one revision to the reporting requirements of 40 CFR part 98, subpart H (Cement Production). The current Part 98, published on October 30, 2009, provides that facilities subject to subpart H report the monthly cement production from each kiln at the facility for verification of reported emissions. In the preamble to the Technical Corrections, Clarifying, and Other Amendments to Certain Provisions of the Mandatory Greenhouse Gas Reporting Rule (75 FR 66434, October 28, 2010), the EPA stated its intent to change the cement production reporting requirements under 40 CFR 98.86 to require annual, facility-wide cement production instead of monthly, kiln-specific cement production (75 FR 66440). Reporting cement production on a kiln-specific basis is inconsistent with cement plant manufacturing practices, because kilns produce clinker (an intermediate product in cement manufacturing) and do not make cement. Although it was obviously the EPA's intention to revise the rule accordingly, inadvertently, this change was not reflected in the rule. This change is also consistent with the requirement in 40 CFR 98.86(b)(3), which requires facilities without continuous emissions monitoring systems (CEMS) to report annual cement production at the facility. Therefore, we are

proposing to amend 40 CFR 98.96(a)(2) to require reporting of facility-wide cement production.

D. Subpart K – Ferroalloy Production

We are proposing two corrections to subpart K of Part 98 (Ferroalloy Production). First, we are proposing to revise Equation K-3 of subpart K to correct the equation. The equation in the current Part 98 does not include a conversion factor from kilograms to metric tons. Therefore, we are proposing to correct Equation K-3 to revise the numerical term "2000/2205" to "2/2205" to account for this conversion.

Next, we are proposing to amend 40 CFR 98.116(e) to require the reporting of the annual process CH₄ emissions (in metric tons) from each electric arc furnace (EAF) used for the production of any ferroalloy listed in Table K-1 of subpart K of Part 98. Per 40 CFR 98.113(d), ferroalloy production facilities are currently required to calculate CH₄ emissions from each EAF used for the production of ferroalloys listed in Table K-1. Facilities are currently required to report CH₄ emissions for EAFs where a CEMS is used to measure emissions. However, the requirement to report emissions of CH₄ from EAFs where the carbon mass balance procedure is used to measure emissions was erroneously omitted from the current Part 98. The proposed amendments are necessary for consistent reporting of CH₄

emissions from all ferroalloy production facilities. Because facilities must already monitor and calculate emissions of CH₄ from each EAF, the proposed amendment would not impose any additional burden on reporters. The proposed data reporting element reflects aggregated annual information that is currently gathered by reporters.

E. Subpart L – Fluorinated Gas Production

Under subpart L of Part 98 (Fluorinated Gas Production), the EPA is proposing to extend temporary, less detailed reporting requirements for fluorinated gas producers for an additional year. In a final rule published on August 24, 2012, the EPA promulgated temporary, less detailed reporting requirements for reporting years 2011 and 2012 (77 FR 51477). As discussed in that final rule, this was intended to allow the EPA time to evaluate concerns raised by the producers that EPA release of the more detailed reporting required by the 2010 final rule would reveal trade secrets, and to consider how the rule might be changed to balance these concerns with the need to obtain the data necessary to inform the development of future GHG policies and programs. The proposed extension would require the same less detailed reporting for reporting year 2013 as for reporting years 2011 and 2012. The extension would allow the EPA, as well as stakeholders, to consider the various options for reporting emissions under subpart L in conjunction with

EPA's on-going evaluations regarding reporting inputs to emission equations for subpart L, whose reporting deadline was deferred until 2015. Fluorinated gas producers and other commenters have often noted that whether or not disclosure of a particular data element poses confidentiality concerns depends on the other data that would be required to be reported and/or disclosed. The extension would allow the various potential reporting requirements and confidentiality determinations to be considered simultaneously.

F. Subpart N – Glass Production

We are proposing several clarifying revisions to subpart N of Part 98 (Glass Production). The more substantive corrections, clarifying, and other amendments to subpart N are found here. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise the monitoring methods used to measure carbonate-based mineral mass-fractions to allow for more accurate measurement methods and to add flexibility for reporters. The current Part 98 requires that such measurements are based on sampling using ASTM D3682-01 (Reapproved 2006) Standard Test Method for Major and Minor Elements in Combustion Residues from Coal Utilization Processes or ASTM D6349-09 Standard Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of

Coal and Coke by Inductively Coupled Plasma-Atomic Emission Spectrometry. However, we have determined that industry consensus standards that specify analysis by X-ray fluorescence (e.g., ASTM C25-11 Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime and ASTM C1271-99 Standard Test Method for X ray Spectrometric Analysis of Lime and Limestone) are more accurate than ASTM D6349-09, which uses inductively coupled plasma or ASTM D3682-01, which uses atomic absorption. Therefore, we are proposing to revise 40 CFR 98.144(b) to specify that reporters determining the carbonate-based mineral mass fraction must use sampling methods that specify X-ray fluorescence. We are proposing to remove ASTM D6349-09 and ASTM D3682-01 from the requirements in 98.144(b). The proposed amendment would allow reporters flexibility in choosing a sampling method (since multiple X-ray fluorescence methods are available) while ensuring that more accurate available measurement methods are applied. For measurements made in the emission reporting year 2013 or prior years, reporters would continue to have the option to use ASTM D6349-09 and ASTM D3682-01. The EPA is not proposing to have reporters revise previously submitted annual reports. These facilities would have the option, but not be required, to use the newly proposed option for the reports submitted to EPA in 2013.

G. Subpart O – HFC-22 Production and HFC-23 Destruction

The EPA is proposing clarifying amendments and other corrections to Subpart O (HFC-22 Production and HFC-23 Destruction); the more substantive corrections, clarifying, and other amendments to Subpart O are found in this section. Additional minor corrections to Subpart O are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to add a sentence to 40 CFR 98.156(c) to clarify how to report the HFC-23 concentration at the outlet of the destruction device in the event that the concentration falls below the detection limit of the measuring device. The provisions of 40 CFR 98.156(c) require facilities that destroy HFC-23 to report the concentration of HFC-23 measured at the outlet of the destruction device during the facility's annual HFC-23 concentration measurements at the outlet of the destruction device. However, if the concentration during the measurements falls below the detection limit of the measuring device, the facility will not be able to report a specific concentration. The proposed sentence clarifies that in this situation, facilities are required to report the detection limit of the measuring device and that the concentration was below that detection limit.

H. Subpart P – Hydrogen Production

We are proposing several clarifying revisions to subpart P of Part 98 (Hydrogen Production). The more substantive

corrections, clarifying, and other amendments to subpart P are found here. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise 40 CFR 98.163(b) to clarify that when the fuel and feedstock material balance approach is followed, the average carbon content and molecular weight for each month used in Equations P-1, P-2, or P-3 may be based on analyses performed annually or analyses performed more frequently than monthly (based on the requirements of 40 CFR 98.164(b)). If the carbon content or molecular weight measurements are performed annually, reporters would use the annual value as the monthly average. If the analyses are performed more often than monthly, then the reporter would use the arithmetic average of these values as the monthly average. The term definitions in Equations P-1, P-2, and P-3 currently refer to the "results of one or more analyses for month n"; however, the monitoring frequencies specified at 40 CFR 98.163(b)(2), (b)(3) and (b)(4) range from weekly to annually, so this clarification is necessary to align these requirements. Further, we are proposing to revise the term definitions in Equations P-1, P-2, and P-3 to remove references to "one or more analyses" since multiple analyses in a month are not always required, as described above.

We are also proposing to modify 40 CFR 98.164(b)(5) to reduce burden by adding flexibility to the fuel and feedstock analysis requirements, consistent with EPA's original intent and subpart C (40 CFR 98.34(a)(6), 40 CFR 98.34(b)(4)), and subpart X (40 CFR 98.244(b)(4)(xiii)). The proposed change allows a facility to analyze fuels and feedstocks using chromatographic analysis, whether continuous or non-continuous.

We are proposing to move recordkeeping requirements currently included in 40 CFR 98.164 (Monitoring and QA/QC requirements) to 40 CFR 98.167 (Records that must be retained). Specifically, 40 CFR 98.164(c) and (d) will be moved to new paragraphs 40 CFR 98.167(c) and (d). Finally, we are proposing to revise 40 CFR 98.166(a)(2) and (a)(3) to remove the requirement to report hydrogen and ammonia production for all units combined. The individual unit production is already reported and can be summed to obtain the production for all units combined.

I. Subpart Q – Iron and Steel Production

We are proposing multiple amendments to subpart Q of Part 98 (Iron and Steel Production) to provide clarification for certain provisions and calculation methods. The more substantive corrections, clarifying, and other amendments to subpart Q are found here. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to amend the definition of the iron and steel production source category in subpart Q, 40 CFR 98.170, to include direct reduction furnaces not co-located with an integrated iron and steel manufacturing process. Reporters are required to report CO₂ emissions from direct reduction furnaces under 40 CFR 98.172(c), and it was the EPA's intent for this reporting requirement to cover all direct reduction furnaces; however, the inclusion of direct reduction furnaces not co-located with an integrated iron and steel manufacturing process was inadvertently excluded from 40 CFR 98.170. The proposed change corrects that omission. This change impacts only one facility currently operating in the United States and that facility is already reporting under Part 98. We do not anticipate this change will impose a burden on additional existing reporters.

The EPA is proposing to amend Equation Q-5 in subpart Q to account for the use of gaseous fuels in EAFs. Many EAF operators use supplemental natural gas for melting scrap in the furnace. One facility that provided input to the EPA on this issue meets approximately 20 percent of its energy requirement with natural gas. Because natural gas combustion products can constitute a significant portion of CO₂ emissions from EAFs, we are proposing to modify Equation Q-5 by adding terms to account for the amount of gaseous fuel combusted and the carbon content of the gaseous

fuel. We are also proposing to amend Equation Q-5 by correcting the term " C_f " to " C_{flux} " and the term " C_c " to " C_{carbon} " to match those presented in the definitions, and to add a closing bracket at the end of the equation.

Additionally, we are proposing to revise 40 CFR 98.173(d) to clarify when the Tier 4 calculation methodology must be used to calculate and report combined stack emissions. The proposed amendment would clarify that the Tier 4 calculation methodology would be used (and emissions would be reported under subpart C of Part 98) if the GHG emissions from a taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, or direct reduction furnace are vented through a stack equipped with a CEMS that complies with the Tier 4 methodology in subpart C of this part, or through the same stack as any combustion unit or process equipment that reports CO₂ emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C. The amendment is necessary to clarify that facilities using either shared or dedicated CEMS must use the appropriate subpart C calculation methodology for determining emissions.

We are also proposing to amend 40 CFR 98.174(c)(2) by removing the term "furnace" from the statement "For the furnace exhaust," because decarburization vessels are not furnaces. We are also proposing to amend 40 CFR 98.174(c)(2) by dividing

(c)(2) into two separate sub paragraphs to separately specify the sampling time for continuously charged EAFs. Newer and more efficient EAFs use the "Consteel®" process, which involves continuous, rather than batch, scrap feed. Thus, "production cycles" may be an ambiguous term for reporters who operate a continuous EAF, and could be interpreted to require lengthy test periods as a single production cycle could extend for several days during which steel was continuously tapped. Therefore, we are proposing to remove the term "production cycles" for continuous EAFs and provide owners or operators with the option of sampling for a period spanning at least three hours.

We are proposing to amend 40 CFR 98.175(a) to clarify that 100 percent data availability is not required for process inputs and outputs that contribute less than one percent of the total mass of carbon into or out of the process. In accordance with 40 CFR 98.174(b)(4), reporters do not collect the monthly mass or annual carbon content of inputs or outputs that contribute less than one percent of the total mass of carbon into or out of the process. Therefore, reporters are not required to estimate missing data for these inputs. Similarly, we are proposing to amend 40 CFR 98.176(e) by clarifying that the reporting requirements of 40 CFR 98.176(e) do not apply to process inputs and outputs that contribute less than one percent of the total mass of carbon into or out of the process.

J. Subpart X – Petrochemical Production

We are proposing changes to subpart X of Part 98 (Petrochemical Production). In addition, we are providing flexibility for reporters and clarifying the calculation methodology, monitoring and reporting requirements, missing data procedures and other provisions under the rule. The more substantive corrections, clarifying, and other amendments to subpart X are found here. Additional minor corrections are discussed in the Table of Revisions to this rulemaking (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise 40 CFR 98.242(b)(2) to clarify that reporters using the mass balance option for a petrochemical process are not to report emissions from the combustion of petrochemical off-gas in any combustion unit, regardless of whether or not the combustion unit is part of the petrochemical process unit. Subpart X currently states that emissions of CO₂, CH₄, and N₂O from only supplemental fuels (i.e., not from the combustion of process off-gas) burned in a combustion unit are reported under subpart C of Part 98 (General Stationary Fuel Combustion Sources). However, this requirement applies only to combustion units that are within the petrochemical process unit because the definition of supplemental fuel applies only to combustion within the process unit. Reporters may interpret this to mean that combustion units not within the petrochemical

process unit should report emissions from combustion of petrochemical off-gas. This would lead to double counting since these emissions are already accounted for in the mass balance calculation. The proposed amendment would avoid possible double counting by specifying that emissions from the combustion of petrochemical process off-gas in combustion units outside the process unit also are not to be reported under subpart C.

We are proposing a change to the calculation methodology in 40 CFR 98.243(b) for CH₄ and N₂O emissions from burning process off-gas for reporters using the CEMS method to determine CO₂ emissions. The proposed calculation method is consistent with the calculation approach for CEMS-monitored sources in subpart C but should not increase burden because Tier 4 units can use the best available information to estimate cumulative annual heat input (see 40 CFR 98.33(c)(4)(i), 40 CFR 98.33(c)(4)(ii)(C)). The proposed calculation method would require reporters to use Equation C-10 of subpart C of Part 98. Reporters would use the cumulative annual heat input from combustion of the off-gas (mmBtu) and proposed fuel gas emission factors from Table C-2 to calculate emissions of CH₄ and N₂O. The proposed fuel gas emission factors in Table C-2 are the same as the "Petroleum" factors previously referenced by subpart X, but we determined that a separate entry for fuel gas is needed for other reasons, as described in Section II.B of this preamble.

We are proposing to modify both 40 CFR 98.243(c)(3) and 40 CFR 98.244(b)(4) to allow subpart X reporters that use the mass balance calculation method to obtain carbon content measurements from a customer of the product. Subpart X currently requires petrochemical manufacturers to determine product carbon contents from their own analyses. This change would provide additional flexibility for sources to obtain the carbon content measurement, and it is consistent with the current option that allows petrochemical manufacturers to obtain the carbon content of feedstocks from feedstock suppliers.

We are proposing a change to 40 CFR 98.243(c)(4) for the alternative sampling requirements for feedstocks and products when the composition is greater than 99.5 percent of a single compound for reporters using the mass balance calculation method. Currently, the alternative can only be used during periods of normal operation and when the product meets specifications. We are proposing changes that will allow the alternative method to be used during all times that the average monthly concentration is above 99.5 percent. The proposed changes would allow greater flexibility for reporters.

For reporters using the mass balance calculation method in 40 CFR 98.243(c)(5), we are proposing to revise definitions for five of the terms in Equation X-1. First, we are proposing to clarify that the term " C_G " includes streams containing CO_2

recovered for sale or use in another process, which is consistent with the current definition of the term " $(CC_{gp})_{i,n}$ ". Second, proposed changes to the terms " $(F_{gf})_{i,n}$ " and " $(P_{gp})_{i,n}$ " would clarify that the inputs for gaseous feedstock and products may be measured on either a mass basis or a volume basis. Finally, we are proposing clarifications to the terms for molecular weight of gaseous feedstocks and products (" $(MW_f)_i$ " and " $(MW_p)_i$ ") to specify that molecular weight is to be determined monthly, which is consistent with the monitoring frequency specified in 40 CFR 98.243(c)(1).

We are proposing to modify the test method description for chromatographic analysis in 40 CFR 98.244(b)(4)(xiii) to remove the word "gas." The proposed change would clarify that a chromatograph other than a gas chromatograph may be used. We are also proposing to modify 40 CFR 98.244(b)(4)(xv) to allow additional methods for the analysis of carbon black feedstock oils and carbon black products. This section of subpart X currently specifies that a reporter may use an industry standard practice for such feedstocks and products. The proposed changes would provide additional flexibility by also allowing the use of a method published by a consensus-based standards organization (i.e., a published method that is not already specifically listed in 98.244(b)(4)). For clarity, the proposed amendments

also would list known consensus-based standards organizations and add a requirement for facilities to document the standard method that they use in the facility monitoring plan required under 40 CFR 98.3(g)(5).

We are proposing to add a requirement under 40 CFR 98.244(c) to clarify the monitoring and quality assurance requirements for flares. Following implementation of Part 98, the EPA received questions concerning the monitoring and quality assurances requirements for flares because while the rule refers to subpart Y for flare emission calculation methods, it does not specify monitoring and quality assurance requirements. As a result, we are clarifying the requirements for flares to specify that facilities must conduct monitoring and quality assurance in accordance with 40 CFR 98.254. The proposed monitoring requirements for flares harmonize subpart X with other subparts under Part 98.

We are proposing to clarify the missing data procedures in 40 CFR 98.245 for missing feedstock and product flow rates and missing feedstock and product carbon contents. This section of subpart X currently specifies that reporters are to develop substitute values for these parameters using the same procedures as for missing fuel carbon contents as specified in 40 CFR 98.35. The proposed amendment clarifies that the procedures for missing fuel carbon contents in 40 CFR 98.35(b)(1) are to be

used only for missing feedstock and product carbon contents, and the procedures for missing fuel usage in 40 CFR 98.35(b)(2) are to be used to develop substitute values for missing feedstock and product flow rates. We are also proposing to add missing data requirements for missing flare data and for missing molecular weights for gaseous feedstocks and products. The amendment would require reporters to develop substitute values for missing molecular weights using the procedures for missing fuel carbon contents as specified in 40 CFR 98.35(b)(1), and substitute values for missing flare data would be developed using the procedures in 40 CFR 98.255(b) and (c). We are proposing these additional missing data procedures so that reporters do not have to contact the EPA individually for guidance on how to proceed in the absence of instructions in the rule. We also expect that these changes will promote consistency both among subpart X reporters and between subpart X reporters and other reporters (e.g., subpart Y reporters).

We are proposing two amendments to clarify the reporting requirements of 40 CFR 98.246(a)(6) for reporters using the mass balance method. This section of subpart X currently requires a reporter to report the name of each method listed in 40 CFR 98.244 that is used to determine a measured parameter. In addition, when a method is not listed in 40 CFR 98.244 (i.e., for flow or mass measurements), the reporter is required to

provide a description of the manufacturer's recommended method. The only methods listed in 40 CFR 98.244 are methods for determining carbon content or molecular weight, and they are all in paragraph (b)(4) of 40 CFR 98.244. Thus, one proposed amendment to clarify 40 CFR 98.246(a)(6) would require reporters to report the name of each method that is used to determine carbon content or molecular weight in accordance with 40 CFR 98.244(b)(4). The current requirement to provide a description of manufacturer's recommended method has been interpreted in various ways, and a wide variety of information has been provided in reports to date. To simplify this reporting requirement, reduce burden, and promote consistency among reporters, the second proposed change would require reporters to describe each type of device used to determine flow or mass (e.g., flow meter or weighing device) and identify the method used to determine flow or mass for each device in accordance with 40 CFR 98.244(b)(1) through (b)(3). Methods could be identified by method number, title, or other descriptor.

We are proposing to revise 40 CFR 98.246(a)(8) to specify that reporters using the mass balance calculation method must identify combustion units outside of the petrochemical process unit that burned process off-gas. This section of subpart X currently requires identification of each combustion unit that burned both process off-gas and supplemental fuel. Supplemental

fuel is defined as fuel burned in a petrochemical process that is not produced within the process itself. Thus, the current language in 40 CFR 98.246(a)(8) requires identification of only those combustion units within a petrochemical process unit that burn off-gas from the process. The purpose of the proposed change is to extend this requirement to combustion units that combust fuel gas generated by the petrochemical process but are not part of the petrochemical process. This additional information is needed to allow us to verify correct reporting of fuel gas in subpart C.

We are proposing to revise 40 CFR 98.246(a)(9) for reporters using the alternative to sampling and analysis for carbon content as specified in 40 CFR 98.243(c)(4) of the mass balance calculation method. One of the proposed changes would clarify the units of time to report in (days) for periods during which off-specification product was produced. A second proposed revision would eliminate reporting of the volume or mass of off-specification products produced. If a facility is complying with 40 CFR 98.243(c)(4) for a product and produces off-specification products so that the average monthly purity does not fall below 99.5 percent, then the facility need not report the amount of off-specification product. However, if the average monthly purity does fall below 99.5 percent, the facility must use the carbon content procedures in 40 CFR 98.243(c)(3) for the off-

specification product, and must report the amount and carbon content of the off-specification product under 40 CFR 98.246(a)(4). The proposed revision would reduce the burden on reporters.

We are proposing several changes to the CEMS reporting requirements in 40 CFR 98.246(b)(4), (b)(5), and (b)(6) to improve the accuracy of emissions attributed to subpart X sources, clarify requirements, and reduce burden. We would revise 40 CFR 98.246(b)(4) to specify that for each CEMS monitoring location where CO₂ emissions from either the process or combustion of off-gas from the process are measured, the facility must provide an estimate of the fraction of the total CO₂ emissions that are attributable to the petrochemical process unit, based on engineering judgment. Subpart X currently requires this reporting for process off-gas combustion emissions but not for process emissions. We need both to correctly determine the quantity of CEMS location emissions attributable to the petrochemical process unit. We would remove the requirements in 40 CFR 98.246(b)(4) and (b)(5) to report CO₂, CH₄, and N₂O emissions from each CEMS location because this requirement is also specified in 40 CFR 98.36(c)(2), which is referenced from 40 CFR 98.246(b)(2). Similarly, we would remove the requirement to report the aggregated total emissions from

all CEMS locations because the EPA will calculate sums from the reported values for individual CEMS locations, as necessary. In 40 CFR 98.246(b)(5) we would also remove the requirements to report inputs to Equation C-8 because we are proposing to replace the requirement to use Equation C-8 with a requirement to use Equation C-10, as noted previously in this section. Instead of the Equation C-8 inputs, reporters would report the total annual heat input for Equation C-10, as required in 40 CFR 98.35(c)(2). Finally, we are proposing to remove the requirement to identify each stationary combustion unit that burns petrochemical process off-gas. We use combustion unit identifications to help verify the distribution of emissions reported under subparts C and X for reporters that use the mass balance method. The identifications are not needed for reporters that use CEMS because all emissions from each combustion unit that burns process off-gas are reported under subpart X. On balance, we expect that these changes will reduce the reporting burden.

K. Subpart Y – Petroleum Refineries

We are proposing changes, technical corrections and clarifying amendments for subpart Y of Part 98 (Petroleum Refineries). The more substantive corrections, clarifying, and other amendments to subpart Y are found here. Additional minor

corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

In conjunction with the addition of fuel gas to Table C-2 as discussed in Section II.B of this preamble, we are proposing revisions to subpart Y to change the reference to Table C-2 at 40 CFR 98.253(b)(2) and (b)(3) from "Petroleum Products" to "Fuel Gas" for calculation of CH₄ and N₂O from combustion of fuel gas. We are also proposing to revise 40 CFR 98.252(a) to remove the reference to the default emission factors for "Petroleum (All fuel types in Table C-1)" in Table C-2. Because the emission factors for Petroleum Products and Fuel Gas are identical, this will not change the result of any emission calculation.

We are proposing to revise 40 CFR 98.253(f)(4) and the terms "F_{SG}" and "MF_C" in Equation Y-12 to clarify the calculation methods for sulfur recovery plants to address both on-site and off-site sulfur recovery plants. We are also proposing changes to the reporting requirements in 40 CFR 98.256(h) to clarify the reporting requirements for on-site and off-site units. The proposed revisions would clarify the requirements that should apply to on-site versus off-site sulfur recovery plants.

We are proposing to clarify 40 CFR 98.253(j) regarding when Equation Y-19 must be used for calculation of CH₄ and CO₂

emissions. The proposed change clarifies that Equation Y-19 must be used to calculate CH₄ emissions if the reporter elected to use the method in 40 CFR 98.253(i)(1), and may be used to calculate CO₂ and/or CH₄ emissions, as applicable, if the reporter elects this method as an alternative to the methods in paragraphs (f), (h), or (k) of 40 CFR 98.253. We are also proposing to clarify reporting requirements to 40 CFR 98.256(j) and (k) to specify that when Equation Y-19 is used for asphalt blowing operations or delayed coking units, the facility must report the relevant information required under 40 CFR 98.256(l)(5) rather than all of the reporting elements in 40 CFR 98.256(l).

L. Subpart Z – Phosphoric Acid Production

We are proposing an additional requirement, minor corrections, and clarifications to subpart Z of Part 98 (Phosphoric Acid Production). The more substantive corrections, clarifying, and other amendments to subpart Z of Part 98 are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

The terminology used in the introductory text of 40 CFR 98.263(b)(1)(ii) and definition of the term "CO_{2n}," could be interpreted as meaning that the method for sampling carbon

content of rock represented direct CO₂ emissions from the process, which was not the EPA's intention. While the equation calculates CO₂ emissions from a process line, the input values obtained from the measurements of grab samples are CO₂ content of the rock. Therefore, we are proposing to amend 40 CFR 98.263(b)(1)(ii) and the description of "CO_{2n,i}" to indicate that the sampling method provides CO₂ content, and not emissions.

We are also proposing to revise 40 CFR 98.266(b) to require that the annual report must include the annual phosphoric acid production capacity (tons), rather than the annual permitted phosphoric acid production capacity. Through implementation of the rule, the EPA has learned that not all facilities have a "permitted" production capacity. The EPA is proposing to revise this requirement to report annual production capacity, as opposed to permitted production capacity, in the current Part 98.³¹ The proposed change acknowledges that not all phosphoric acid production facilities have a permitted production capacity. Additionally, not all facilities produce to the permitted capacity. This change is necessary to ensure that the EPA collects consistent annual production capacity data and will

³¹ See Table 9 of this preamble for the EPA's proposed data category assignment and confidentiality determination for this data element.

provide a better characterization of the relationship between industry production and emissions.

We are also proposing to amend 40 CFR 98.266 to add a requirement to report the number of times missing data procedures were used to estimate the CO₂ content of the phosphate rock. The proposed requirement is consistent with 40 CFR 98.264(b), which allows for determination of either inorganic carbon content or CO₂ content.

M. Subpart AA – Pulp and Paper Manufacturing

We are proposing changes to subpart AA of Part 98 (Pulp and Paper Manufacturing) to revise default emission factors and clarify the information that must be reported. The more substantive corrections, clarifying, and other amendments to subpart AA of Part 98 are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to amend 40 CFR 98.273(a)(3), 40 CFR 98.276(e) and Equation AA-1 to remove the references to site-specific emissions factors because there are no methods or requirements in subpart AA for deriving the site-specific GHG emission factors for biomass combustion.

We are proposing revisions to the emission factors shown in Tables AA-1 and AA-2 to correct format errors that occurred in the printing of the rule in the CFR. Specifically, in Table AA-

1, the CH₄ and N₂O emission factors were intended to apply to each fuel. However, when printed in the Federal Register, lines were added to separate each row/fuel, and this format change created the appearance that the factors apply only to the first fuel listed in the table. To correct this error, we are proposing to insert the CH₄ and N₂O emission factors for each individual fuel. Today's proposed changes will make the rule conform to Tables AA-1 and AA-2 as they originally were proposed in the April 10, 2009 Federal Register (74 FR 16692). A similar error occurred with Table AA-2. In addition, the Kraft Lime Kiln N₂O factors were inadvertently omitted in the printing of Table AA-2; it was intended to be zero (0) for all fuels in Table AA-2 (as proposed to be amended in the August 11, 2010 Federal Register (75 FR 48811)).

In addition to correcting formatting errors, we are proposing revisions to the CH₄ and N₂O emission factors for pulping liquor in Table AA-1 based on emissions test data made available to us for eight U.S. recovery furnaces in the AF&PA Petition as discussed above. Our analysis of that data confirms that the information contained in the AF&PA Petition is more robust and relevant for U.S. recovery furnaces than the original

Table AA-1 emission factors which were previously adopted from a literature review.³²

We are also proposing additional changes to Table AA-2 to

- (1) Amend the title to remove the reference to fossil fuel since the table contains a biogenic fuel as well (biogas);
- (2) specify that the emission factors for residual and distillate oil apply for any type of residual (no. 5 or 6) or distillate (no. 1, 2 or 4) fuel oil to clarify our intent that the emissions factors apply to all grades of these fuel types; and
- (3) add a row to specify that the Table C-2 emission factor for CH₄ and the Table C-2 emission factors for CH₄ and N₂O may be used, respectively, for ancillary lime kilns and calciners combusting fuels (e.g., propane, used oil, and lubricants) that were not previously listed in Table AA-2.

The Technical Support Document for Subpart AA from the final Part 98³³ explains that the operating temperatures in rotary lime kilns appear to be too high for appreciable formation of N₂O, so an emission factor of zero is proposed for N₂O from ancillary fuel combustion in pulp mill lime kilns.

³² See the memorandum in the docket titled, "Kraft Pulping Liquor and Woody Biomass Methane (CH₄) and Nitrous Oxide (N₂O) Emission Factor Literature Review."

³³ Available at:
http://www.epa.gov/ghgreporting/documents/pdf/archived/tsd/TSD_Pulp_and_Paper_2_11_09.pdf.

We are proposing to amend 40 CFR 98.276(k) to clarify the EPA's intent regarding the annual pulp and/or paper production information that must be reported. Since publication of the rule, we have received questions from the industry about what this requirement means and the units of measure to use for reporting pulp production. Hence, we are proposing to amend the rule to clarify that the annual production information must consist of the production of air-dried, unbleached virgin pulp produced onsite during the reporting year and the production of paper products exiting the paper machine(s) during the reporting year, prior to application of any off-machine coatings.³⁴

Greenhouse gas emissions from pulp and paper operations reported under subpart AA are dependent on the amount of pulp produced. Reporting the total annual production of air-dried unbleached virgin pulp provides a common reporting basis for all types of pulp mills regardless of production processes (e.g., bleaching, secondary fiber pulping, and paper making) that happen downstream of the virgin pulping process where the GHG emissions are generated.

N. Subpart BB – Silicon Carbide Production

³⁴ See the memorandum "Proposed data category assignments and confidentiality determinations for new and substantially revised data elements in the proposed '2013 Revisions to the Greenhouse Gas Reporting Rule and Confidentiality Determinations for New or Substantially Revised Data Elements'" (hereafter referred to as "Confidentiality Determinations Memorandum") (Docket Id. No. EPA-HQ-OAR-2012-0934) for the proposed category assignments and confidentiality determinations for new and revised data elements.

We are proposing several revisions to subpart BB of Part 98 (Silicon Carbide Production). The more substantive corrections, clarifying, and other amendments to subpart BB of Part 98 are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise 40 CFR 98.282(a) to remove the requirement for silicon carbide production facilities to report CH₄ emissions from silicon carbide process units or furnaces. We are proposing to revise 40 CFR 98.283(d) to remove the CH₄ calculation methodology. The current CH₄ calculation methodologies in subpart BB overestimate the emissions of CH₄ from silicon carbide facilities because the equations do not take into consideration the destruction of CH₄ emissions. Because these emissions are typically controlled, emissions from these facilities are minimal, and the EPA has determined that the requirement to report CH₄ emissions is not necessary to understand the emissions profile of the industry.

Reporters must continue to monitor and report CO₂ emissions from silicon carbide process units and production furnaces. We are proposing to revise 40 CFR 98.283 so that CO₂ emissions are to be calculated and reported for all process units and furnaces combined. The EPA intended in the final Part 98 (October 30,

2009) to require reporting from all silicon carbide process units and production furnaces, as specified in 40 CFR 98.282. However, 40 CFR 98.283 states that "You must calculate and report the annual process CO₂ emissions from each silicon carbide process unit or production furnace using the procedures in either paragraph (a) or (b) of this section." The proposed correction would revise 40 CFR 98.283 for consistency with the reporting requirements of 40 CFR 98.286 and reduce burden by combining all emissions.

O. Subpart DD – Electrical Transmission and Distribution
Equipment Use

We are proposing two substantive corrections to subpart DD (Electrical Transmission and Distribution Equipment Use) in this section. We are proposing to revise 40 CFR 98.304(c)(1) and (c)(2) to correct the accuracy and precision requirements for weighing cylinders. In the current Part 98, the subpart DD regulatory text for 40 CFR 98.304(c)(1) and (c)(2) presents the required scale accuracies as "2 pounds of the scale's capacity." The scale accuracy requirement for subpart DD was intended to be "2 pounds of true weight," as expressed in the "Technical Support Document: Emissions from Electric Power Equipment Use" and "EPA's Response to Public Comments: Subpart DD: Electric

Transmission and Distribution Equipment Use”³⁵, and the preamble to the final Part 98 (74 FR 56260, October 30, 2009). The proposed amendments would make 40 CFR 98.304(c)(1) and (c)(2) consistent with the EPA’s intent.

P. Subpart FF – Underground Coal Mines

We are proposing multiple amendments to subpart FF of Part 98 (Underground Coal Mines) to clarify certain provisions and equation terms, harmonize reporting requirements, and improve verification of annual GHG reports. The more substantive corrections, clarifying, and other amendments to subpart FF of Part 98 are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise the terminology in subpart FF in response to questions submitted by reporters. Reporters have noted that ventilation does not take place through wells, but rather mine ventilation system shafts or vent holes, and degasification systems do not use shafts, but rather wells or gob gas vent holes. Reporters have also stated that mine ventilation air is not flared, rather it is destroyed using a ventilation air methane (VAM) oxidizer. Therefore we are proposing to revise provisions in 40 CFR 98.320(b), 40 CFR 98.322(b) and (d), 40 CFR 98.323(c), and 40 CFR 98.324(b) and

³⁵ See <http://www.epa.gov/ghgreporting/reporters/subpart/dd.html>.

(c) to adopt terminology that more accurately reflects industry operations.

We are also proposing to revise the reporting requirements of subpart FF to include additional data elements that will allow the EPA to verify the data submitted, perform a year to year comparison of the data, and assess the reasonableness of the data reported.³⁶ The data elements are readily available to the reporter and would not require additional data collection or monitoring or significantly increase the reporting burden. The additional data elements are included in the proposed revised 40 CFR 98.326(h), (i), (j), (o), (r), and new requirements (t) and (u) and include: the moisture correction factor used in the emissions equations, units of measure for the volumetric flow rates reported, method of determining the gas composition, the start date and close date of each well or shaft, the number of days the well or shaft was in operation during the reporting year, and the amount of CH₄ routed to each destruction device. We are also proposing to add a reporting requirement (40 CFR 98.326(u)) for the reporting mines to provide the Mine Safety and Health Administration (MSHA) identification. This identification number will allow the EPA to easily identify the facility for verification and comparison of the Inventory data

³⁶ See Table 9 of this preamble for the proposed category assignments and confidentiality determinations for each proposed data element.

with GHGRP data. The reporting requirements have also been updated to harmonize with changes to the calculation methods as itemized in the Table of Revisions (see Docket ID No. EPA-HQ-2-12-0934).

Q. Subpart HH – Municipal Solid Waste Landfills

We are proposing multiple revisions to 40 CFR part 98, subpart HH (Municipal Solid Waste Landfills) to clarify equations and amend monitoring requirements to reduce burden for reporters. The more substantive corrections, clarifying, and other amendments to subpart HH are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to amend the definition of the degradable organic carbon (DOC) term for Equation HH-1 to indicate that the DOC values for a waste type must be selected from Table HH-1. When we originally proposed subpart HH in April of 2009, Equation HH-1 applied to both MSW and industrial waste landfills. When we finalized Subpart HH for MSW landfills only, the definition of the DOC term allowed for the default value from Table HH-1 or measurement data, if available. Although we included measurement methods for determining site-specific DOC values for industrial waste streams within Subpart TT, we do not consider that these laboratory methods are suitable for

determining the DOC for MSW landfills in subpart HH because of the variability and heterogeneity of MSW.

The EPA may take into consideration the usage of site-specific DOC values for MSW landfills in Equation HH-1 if suitable measurement methods are available. We specifically request comment from reporters who have used measurement methods for determining DOC. We request that the commenter provide information on the type of waste streams for which measurement methods were used, the analytical method used to determine DOC, and procedures used to ensure that the samples tested were representative of the waste stream tested for different years. We also note that, if measurements of DOC are made for different years, the DOC variable in Equation HH-1 should be a function of the year the waste is placed in the landfill. As currently written, the DOC term in Equation HH-1 is a constant for a given waste type and is not a function of the disposal year. We therefore also request comment on the need to revise Equation HH-1 and the definition of DOC to allow DOC to be a different value for different years that a waste is placed in the landfill.

We are proposing to amend the definition of the term "F" in Equation HH-1 (fraction by volume of CH₄ in the landfill gas) to further clarify that this term should be corrected to zero percent (0%) oxygen. Unlike the concentration of CH₄ in the

landfill gas as measured for use in Equation HH-4, the term F is more accurately defined as the fraction of the dissimilated carbon that is metabolized to CH_4 . Some landfill gas collection systems may draw ambient air into the collected landfill gas, thereby diluting the concentration of CH_4 in the landfill gas. The proposed amendment is needed to correct measurements of CH_4 concentrations made in gas collection systems (or elsewhere) for ambient air dilution so that the resultant value of F more closely matches the fraction of degraded carbon that is generated as CH_4 .

We are also proposing to revise the definition of parameter "N" in Equation HH-4 and the provisions of 40 CFR 98.343(b)(2)(i), (ii), (iii)(A), and (iii)(B). We received comments from landfill owners and operators that the requirement to sample CH_4 concentrations weekly was burdensome, particularly for closed landfills, and unnecessary because the CH_4 concentrations did not vary appreciably over the year. Some landfill owners and operators provided EPA with their weekly flow and CH_4 concentration data for the 2011 reporting year for 395 unique landfills. We reviewed and analyzed the data and determined that reducing the CH_4 concentration monitoring frequency from weekly to monthly would increase the overall uncertainty of a landfill's CH_4 recovery from ± 8 percent to

±10.5 percent. (See "Review of Weekly Landfill Gas Volumetric Flow and Methane Concentrations," October 18, 2012, in Docket ID No. EPA-HQ-OAR-2012-0934.) It is reasonable to conclude that the on-going annual costs associated with monitoring CH₄ concentrations monthly would be approximately one-fourth the cost of monitoring weekly. Thus, landfill owners can realize a significant savings in their monitoring costs while not significantly increasing the uncertainty in the calculated CH₄ recovery. Based on the data provided by the landfill owners and operators and our analysis of that data, we are proposing to revise the minimum monitoring frequency from weekly to monthly.

We are proposing to amend the oxidation fraction default value used in Equations HH-5, HH-6, HH-7, and HH-8 of subpart HH. We received comments from landfill owners and operators that the oxidation fraction default value of 10 percent that is required to be used in these equations is too low and that many landfills exhibit much higher oxidation fractions. Over the past several years, numerous U.S. landfills have been tested to estimate the oxidation fraction; the newly tested landfills have been predominately landfills with gas collection systems and clay soil or "other soil mixture" covers. We reviewed the oxidation study data and analyzed Subpart HH data to evaluate various options for revising the default oxidation fraction. Based on our review, we agree that the 10 percent soil oxidation

fraction likely underestimates the amount of methane oxidized in the surface soil layer when the landfill gas flow through the soil surface is reduced, as is the case for landfills with gas collection systems. We considered a revised single default oxidation fraction or a default oxidation fraction based on the type of cover soil used at the landfill, but these defaults do not take in account the key variable, which is the methane flux rate entering the surface soil layer. Based on our analysis, we are proposing three different default oxidation fractions depending on the methane flux "bin," found in new proposed Table HH-4. For cases where the methane flux is projected to be high (greater than 70 grams/m²/day), the default oxidation fraction remains as 10 percent. For cases where the methane flux is projected to be low (less than 10 grams/m²/day), the default proposed oxidation fraction is 35 percent. For cases with moderate methane flux rates (10 to 70 grams/m²/day), the proposed default oxidation fraction is 25 percent. We are also proposing to add requirements in paragraph 98.346(h) and paragraphs 98.346(i)(8), (10), and (11) for facilities to report the oxidation fraction used in each of Equations HH-5, HH-6, HH-7, and HH-8.³⁷ We have concluded that this binned approach provides a more realistic estimate of the role of methane oxidation in

³⁷ The EPA is proposing category assignments and confidentiality determinations for these new and revised data elements in the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

the surface soil on the methane emissions than the single default oxidation fraction. We are including Table HH-4 to reference these values. Table HH-4 also provides a calculation method to determine the methane flux rate to be used for determining the oxidation fraction when Equations HH-5, HH-6, HH-7, or HH-8 are used. Reporters under subpart TT will also use Table HH-4 when Equation TT-6 is used to determine the methane generation adjusted for oxidation. For further information regarding our analysis of methane oxidation fractions, see "Review of Methane Flux and Soil Oxidation Data", December 7, 2012, in Docket ID No. EPA-HQ-OAR-2012-0934.

We are also proposing to amend Equations HH-6, HH-7, and HH-8 and surrounding text to generalize these equations in the event that the landfill contains multiple landfill gas collection system measurement locations and/or multiple destruction devices. When there is a single landfill gas measurement location, these equations are identical to the existing equations. However, the existing equations were inadequate to calculate CH₄ emissions at landfills with gas collection systems that have multiple measurement locations and/or multiple destruction devices. In addition to the revisions proposed to clarify equation term definitions when multiple measurement locations or destruction devices are used, we are also proposing to revise the definition of the f_{Dest} term

for Equation HH-6 and HH-8 to clarify that the fraction of hours the destruction device was operating should be calculated as the number of operating hours for the device divided by the hours that gas flow as sent to the device.

We are also proposing to amend the first sentence in 40 CFR 98.345(c) to revise "in reporting years" to "in the reporting year" to clarify that the missing data procedures are for a reporting year and that reporters do not need to report substitute data information for years prior to the current reporting year, thereby reducing the burden on reporters.

Finally, we are proposing to revise 40 CFR 98.346(d)(1) and (e) to move the reporting elements pertaining to the methane correction factor (MCF) from paragraph (d)(1) to paragraph (e) because MCF is not a function of the waste type. This amendment eliminates the duplicative reporting requirements for MCF and its related reporting elements (i.e., reporters would no longer be required to report this information for each waste type).

R. Subpart LL - Suppliers of Coal-based Liquid Fuels

We are proposing multiple revisions to 40 CFR part 98, subpart LL (Suppliers of Coal-based Liquid Fuels) to clarify requirements and amend data reporting requirements to reduce burden for reporters. This section includes the more substantive corrections, clarifying, and other amendments to subpart LL.

Additional minor corrections are discussed in EPA's Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

To reduce burden, we are proposing to remove the requirements at 40 CFR 98.386(a)(1), (a)(5), (a)(13), (b)(1), and (c)(1) for each facility, importer, and exporter to report the annual quantity of each product or natural gas liquid on the basis of the measurement method used. Reporters would continue to report the annual quantities of each product or natural gas liquid in metric tons or barrels at 40 CFR 98.386(a)(2), (a)(6), (a)(14), (b)(2), and (c)(2). We are also retaining the requirement to report a complete list of methods used to measure the annual quantities reported for each product or natural gas liquid.

S. Subpart MM - Suppliers of Petroleum Products

We are proposing several revisions to 40 CFR part 98, subpart MM (Suppliers of Petroleum Products) to clarify requirements and amend data reporting requirements to reduce burden for reporters. This section includes the more substantive corrections, clarifying, and other amendments to subpart MM. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to clarify the equation term for "Product_i" at 40 CFR 98.393(a)(2) to exclude those products that entered the refinery but are not reported under 40 CFR

98.396(a)(2). We are proposing harmonizing changes to 40 CFR 98.394(b) to make the equipment calibration requirements for petroleum products suppliers consistent with other Part 98 calibration requirements. The requirements for equipment calibration in 40 CFR part 98, subpart A (General Provisions) allow for postponement of calibrations for units and processes that operate continuously with infrequent outages. We are proposing similar provisions be incorporated into the subpart MM equipment calibration requirements. The proposed changes would also provide flexibility for reporters meeting the equipment calibration requirements.

As with the proposed changes to subpart LL, in order to reduce burden for reporters, we are proposing to remove the requirements of 40 CFR 98.396(a)(1), (a)(5), (a)(13), (b)(1), and (c)(1) for each facility, importer, and exporter to report the annual quantity of each petroleum product or natural gas liquid on the basis of the measurement method used. Reporters would continue to report the annual quantities of each petroleum product or natural gas liquid in metric tons or barrels at 40 CFR 98.396(a)(2), (a)(6), (a)(14), (b)(2), and (c)(2). We are also retaining the requirement to report a complete list of methods used to measure the annual quantities reported for each product or natural gas liquid.

In order to reduce the recordkeeping and reporting burden, the EPA is proposing to eliminate the reporting requirement for individual batches of crude oil feedstocks. The reporting requirements for crude oil at 40 CFR 98.396(a)(20) are proposed to be changed to require only the annual quantity of crude oil. We are also proposing to eliminate the requirement to measure the API gravity and the sulfur content of each batch of crude oil at 40 CFR 98.394(d). We are also proposing to remove the requirement at 40 CFR 98.394(a)(1) that a standard method by a consensus-based standards organization be used to measure crude oil on site at a refinery, if such a method exists. Other associated changes to the rule to harmonize with this change include removing the definition of "batch," removing the procedures for estimating missing data for determination of API gravity and sulfur content at 40 CFR 98.395(c), and the recordkeeping requirement for crude oil quantities at 40 CFR 98.397(b). Reporters would still be required to maintain all the records required to support information contained in the reports as specified at 40 CFR 98.397(a).

We are proposing to include the definitions of natural gas liquids (NGL) and bulk NGLs in the subpart MM definitions at 40 CFR 98.397 to clarify the distinction between NGL and bulk NGL for reporting purposes under subpart MM. "Natural gas liquids (NGLs)" for purposes of reporting under subpart MM means

hydrocarbons that are separated from natural gas as liquids through the process of absorption, condensation, adsorption, or other methods, and are sold or delivered as differentiated product. Generally, such liquids consist of ethane, propane, butanes, or pentanes plus. Those subject to subpart MM are required to report NGLs as the individual differentiated product and are not required to conduct testing to determine additional components (i.e., impurities) that are contained within the differentiated product. For a mixture, the individual components should be reported. For example, if a refinery receives a known mixture of propane and ethane, the refiner must report the quantities of propane and ethane individually. Undifferentiated NGLs would be reported as bulk NGLs for subpart MM. We are also proposing to clarify the reporting requirements for bulk NGLs and NGLs. NGLs should be reported either as differentiated NGLs or as bulk NGLs. The requirement at 40 CFR 98.396(a)(22) is proposed to be modified to specify that NGLs reported in 40 CFR 98.396(a)(2) should not be reported again in 40 CFR 98.396(a)(22).

Finally, we are proposing to revise the default density and emission factors in Table MM-1 for propane, propylene, ethane, ethylene, isobutane, isobutylene, butane, and butylene. Because these compounds are gases under standard conditions, the default density metric must be presented using a stated temperature and

pressure. For all compounds except ethylene, we are proposing estimates of density and calculated emission factors at 60 degrees F and saturation pressure, the standard temperature and pressure conditions used by industry. For ethylene, because it cannot be liquefied above 48.6°F, we have selected as a basis for the values of density and emission factor conditions at 41°F (slightly under the critical temperature) and the corresponding saturation pressure. The current and proposed values for default density and emission factors are included in Table 6 of this preamble.

Table 6. Proposed Changes to Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids

Products	Column A: density (metric tons/bbl)	Column C: emission factor (metric tons CO₂/bbl)	Proposed Column A: density (metric tons/bbl)	Proposed Column C: emission factor (metric tons CO₂/bbl)
Ethane ³	0.0866	0.2537	0.0579	0.170
Ethylene ⁴	0.0903	0.2835	0.0492	0.154
Propane ³	0.0784	0.2349	0.0806	0.241
Propylene ³	0.0803	0.2521	0.0827	0.260
Butane ³	0.0911	0.2761	0.0928	0.281
Butylene ³	0.0935	0.2936	0.0972	0.305
Isobutane ³	0.0876	0.2655	0.0892	0.270
Isobutylene ³	0.0936	0.2939	0.0949	0.298

³The density and emission factors for components of LPG determined at 60°F and saturation pressure (LPGs other than ethylene)

⁴The density and emission factor for ethylene determined at 41°F and saturation pressure.

T. Subpart NN — Suppliers of Natural Gas and Natural Gas Liquids

The EPA is proposing multiple corrections and clarifying amendments to the provisions of subpart NN (Suppliers of Natural Gas and Natural Gas Liquids). The more substantive corrections, clarifying, and other amendments to subpart NN are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

First, we are proposing to amend the definition of Local Distribution Companies (LDCs) in 40 CFR 98.400(b) to coincide with the definition of LDCs in 40 CFR 98.230(a)(8) (40 CFR part 98, subpart W). For LDCs that operate in multiple states, we are proposing to clarify that the operations in each state are considered a separate LDC. For example, if an LDC owns and operates pipelines in two adjacent states, the LDC is considered two separate entities both for the purpose of determining applicability and for registering and reporting under subpart NN. We are also proposing a revision to clarify that interstate and intrastate pipelines delivering natural gas either directly to major industrial users or to farm taps upstream of the local distribution company inlet are not included in the definition of an LDC. The proposed changes are harmonizing changes that improve the consistency of provisions across Part 98.

We are also proposing to revise 40 CFR 98.406(b)(7).³⁸ The current subpart NN rule requires that LDCs report annual volume of natural gas delivered to each meter registering supply equal to or greater than 460,000 thousand standard cubic feet (Mscf) during the calendar year. The EPA is proposing a change in the calculation and reporting requirements that would require that if the LDC knows that a series of meters serves one particular customer receiving a total of greater than 460,000 Mscf during the year, the LDC would be required to report these deliveries per customer rather than per meter. If the LDC does not know if the series of meters serve a single customer or multiple customers, the LDC may continue to report deliveries to individual meters. Customers that receive over 460,000 Mscf (approximately 25,000 Mtons CO₂) for use in combustion are required to report emissions under subpart C or subpart D. We are proposing the change to 40 CFR 98.407(b)(7) in order to greatly minimize double counting emissions reported under subparts C or D and emissions that would result from natural gas supplied reported under subpart NN from facilities that may receive a total of over 460,000 Mscf of natural gas through several meters.

³⁸ The EPA has proposed a data category and confidentiality determination for this revised data element. See the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

The EPA received comments that the multiple streams of natural gas included in Equation NN-5 may have different characteristics (e.g., HHV). Subpart NN currently requires the use of a single emission factor for all types of gas streams accounted for in Equation NN-5 (e.g., gas stored, liquefied natural gas removed from storage, natural gas received from local production). Because the characteristics of these streams may differ, the EPA agrees that emissions associated with the supply of natural gas would be more accurately calculated using emission factors specific to each stream. To allow reporters the flexibility to use different emission factors for different natural gas streams, the EPA is proposing Equation NN-5 be replaced with two equations, Equations NN-5a and NN-5b. The greenhouse gas quantity associated with the net amount of natural gas that is placed into or removed from storage during the year is proposed to be calculated using Equation NN-5a. Emissions that would result from the combustion or oxidation of natural gas supplied that bypassed the city gate are proposed to be calculated using Equation NN-5b. Separating Equation NN-5 into two equations does not impose additional burden on reporters. LDCs already monitor the volume of gas placed into or removed from storage separately from natural gas that bypassed the city gate. Further, LDCs may use different emission factors in Equations NN-5a and NN-5b, though they are not required to.

The default value may be used. Additionally, we are proposing a change to Equation NN-6 that incorporates the two proposed NN-5 equations. With this change, all the equation terms resulting in net additions to the CO₂ quantity are added, and terms resulting in decreases to the CO₂ quantity are subtracted from the LDC's subpart NN total. This change will make Equation NN-6 easier to understand.³⁹ Finally, the EPA has learned that o-grade as well as y-grade bulk NGLs are fractionated by facilities subject to subpart NN. Additionally, the EPA has learned that some fractionators strip out only a portion of the bulk NGL stream and supply the remaining bulk NGL downstream to other fractionators, where it is separated into its constituent products. Therefore, the EPA is proposing revisions to 40 CFR 98.406(a)(4) to add new reporting elements that require reporting of the quantity of o-grade, y-grade, and other types of bulk NGLs received, and the quantity not fractionated, but supplied downstream.⁴⁰

We are also proposing changes to the HHV and emission factors in Table NN-1 and NN-2. As discussed in this preamble for subpart C and subpart MM, we are proposing to revise the

³⁹ We are also proposing to revise the reporting requirements in 40 CFR 98.406(b) in order to harmonize the reported data with the change to the equations in subpart NN. See the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934) for the proposed category assignments and confidentiality determinations for new and revised data elements.

⁴⁰ See the Confidentiality determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934) for the proposed category assignments and confidentiality determinations for new and revised data elements.

default HHV and emission factors for the individual components of liquid petroleum gases (LPG) including propane, ethane, isobutane, and butane. These values for Table NN-1 and NN-2 are based on the same HHV, density and carbon share used for the HHV and emission factors in Table C-1 and MM-1. Since these compounds are gases under standard conditions, the default emission factors in Table NN-1 and NN-2 (kg CO₂ per MMBtu or MT CO₂ per barrel) and HHV in Table NN-1 (MMBtu per barrel) must be presented using a density at a stated temperature and pressure. For all these LPGs, we are proposing calculated values of HHV and emission factors using the density of the liquid at 60°F and saturation pressure, standard temperature and pressure conditions used by industry. The current and proposed default HHV and emission factors are shown in Tables 7 and 8 of this preamble.

Table 7. Proposed Changes to Table NN-1 to Subpart NN of Part 98—Default Factors for Calculation Methodology 1 of This Subpart

Fuel	Default high heating value factor	Default CO₂ emission factor (kg CO₂/MMBtu)	Proposed Default higher heating value¹	Proposed Default CO₂ emission factor (kg CO₂/MMBtu)
Natural Gas	1.028 MMBtu/Mscf	53.02	1.026 MMBtu/Mscf	53.06
Propane	3.822 MMBtu/bbl	61.46	3.84 MMBtu/bbl	62.87
Normal butane	4.242 MMBtu/bbl	65.15	4.34 MMBtu/bbl	64.77
Ethane	4.032 MMBtu/bbl	62.64	2.85 MMBtu/bbl	59.60
Isobutane	4.074 MMBtu/bbl	64.91	4.16 MMBtu/bbl	64.94
Pentanes	4.620 MMBtu/bbl	70.02	4.62 MMBtu/bbl	70.02

Fuel	Default high heating value factor	Default CO ₂ emission factor (kg CO ₂ /MMBtu)	Proposed Default higher heating value ¹	Proposed Default CO ₂ emission factor (kg CO ₂ /MMBtu)
plus				

¹ Conditions for higher heating values presented in MMBtu/bbl are 60°F and saturation pressure.

Table 8. Proposed Changes Table NN-2 to Subpart NN of Part 98—Default Values for Calculation Methodology 2 of This Subpart

Fuel	Unit	Default CO ₂ emission value (MT CO ₂ /Unit)	Proposed Default CO ₂ emission value (MT CO ₂ /Unit) ¹
Natural Gas	Mscf	0.055	0.0544
Propane	Barrel	0.235	0.241
Normal butane	Barrel	0.276	0.281
Ethane	Barrel	0.253	0.170
Isobutane	Barrel	0.266	0.270

¹ Conditions for emission value presented in MT CO₂/bbl are 60°F and saturation pressure.

U. Subpart PP – Suppliers of Carbon Dioxide

We are proposing three substantive amendments to subpart PP of Part 98 (Suppliers of Carbon Dioxide) that are described in this section. One additional minor correction is discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to amend 40 CFR 98.423(a)(3)(i) to clarify that both capture and extraction facilities may use Equation PP-3a to aggregate annual data from multiple flow meters. In the December 17, 2010 Technical Corrections, Clarifying, and Other Amendments to the GHG Reporting Rule (75 FR 79092), we modified the provisions of 40 CFR 98.423(a)(3) to add Equation PP-3b to account for situations where a CO₂ stream is segregated such

that only a portion is captured for commercial application or for injection and where a flow meter is used prior to the point of segregation; we also introduced the two-meter approach for facilities with production process units that capture a CO₂ stream. At that time, we made a harmonizing change and re-designated Equation PP-3 to Equation PP-3a. However, we inadvertently limited the application of equation PP-3a to facilities with production processes, whereas in the original promulgation, Equation PP-3 could be used by all facilities (including those with production wells) that have multiple streams and multiple flow meters. In this rulemaking we are proposing to amend 40 CFR 98.423(a)(3)(i) to clarify that facilities with CO₂ production wells that extract or produce a CO₂ stream may use Equation PP-3a to aggregate the total annual mass of CO₂ from multiple extracted streams. This clarifying change increases the reporting flexibility for facilities with CO₂ production wells by allowing them to aggregate CO₂ emissions from multiple CO₂ streams, without sacrificing the quality of data reported.

Finally, we are proposing to amend the reporting requirements of 40 CFR 98.426(f)(10) and (f)(11), which require reporting the aggregated annual CO₂ quantities transferred to enhanced oil and natural gas recovery or geologic sequestration.

The proposed changes would clarify that these end use application options reflect injection of CO₂ to geologic sequestration or enhanced oil recovery as covered by 40 CFR part 98, subparts RR and UU, respectively.

V. Subpart QQ – Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-Charged Equipment or Closed-Cell Foams

We are proposing multiple revisions to 40 CFR part 98, subpart QQ (Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-Charged Equipment or Closed-Cell Foams). The more substantive corrections, clarifying, and other amendments to subpart QQ are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934). We are proposing to correct the equation term " S_t " in Equations QQ-1 and QQ-2 to clarify that the input may be mass (charge per piece of equipment) or density (charge per cubic foot of foam, kg per cubic foot). The proposed revision is necessary to ensure that the input for each equation is in the correct units when the density of F-GHG in the foam is used.

We are proposing to amend an example within the definition of "closed-cell foam" at 40 CFR 98.438. The revised text would read "Closed-cell foams include but are not limited to polyurethane (PU) foam contained in equipment, ..." The EPA is

proposing this change to clarify that the reporting requirements apply to devices that contain F-GHGs in closed-cell foams even if the device is not an "appliance" as defined in this section. Appliances are defined as devices that contain a fluorinated greenhouse gas refrigerant. This change clarifies that the reporting requirements apply to equipment such as water heaters which have closed-cell foam but no refrigerant charge. Similarly the reporting requirements apply to refrigeration and air conditioning equipment that contain closed-cell foam but not refrigerants that are covered by this reporting program. As part of this change, we are also proposing to replace the term "appliance" with the term "equipment" at 40 CFR 98.436(a)(3), (a)(4), (a)(6)(ii), (a)(6)(iii), (b)(3), (b)(4), (b)(6)(ii), and (b)(6)(iii). This clarification does not subject any new foams to the reporting requirements as subpart QQ currently requires the reporting of all fluorinated GHG closed-cell foams excluding packaging foam.

We are proposing to revise the reporting requirements for 40 CFR 98.436(a)(6)(iii) and (b)(6)(iii) to match the reported data element to the units required to be reported. The proposed revision is a change from "mass in CO₂e" to "density in CO₂e."

The units specified for the data elements in the current subpart QQ are kg CO₂e/cubic foot, and are unchanged in this proposal.⁴¹

We are proposing to amend the definition of "pre-charged electrical equipment component" at 40 CFR 98.438. The EPA is revising the definition to include components charged with any fluorinated greenhouse gas. The current definition is limited to components charged with SF₆ or PFCs. The purpose of this revision is to align the definition of a component with that of "pre-charged electrical equipment" which is defined as containing a fluorinated greenhouse gas.

We are also proposing to remove the following reporting requirements to alleviate burden on reporters: 40 CFR 98.436(a)(5), (a)(6)(iv), (b)(5), and (b)(6)(iv). These provisions require reporters to supply the dates on which pre-charged equipment or closed-cell foams were imported or exported. The EPA established these reporting requirements to allow the agency to compare these data with shipment manifest data from Customs and Border Protection (CBP). The EPA has since learned that the data required under this subpart is more specific than the data found in the manifests, and has determined that the remaining information provided by the

⁴¹ The EPA has proposed a data category and confidentiality determination for these revised data elements. See the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

facilities is sufficient for verification purposes. The EPA can compare total annual imports and exports of appliances with reported data without needing date-specific information. In addition, the EPA has been made aware of the burden created by tracking and reporting each shipment by date. Many importers and exporters do not maintain data that include the appliance charge and foam type by date of import or export. Some of those that do indicated to the EPA that this would result in tens of thousands of reports. We do not believe that this level of specificity is necessary to understand the net import and export of fluorinated greenhouse gases within appliances and closed-cell foams. Given the burden and low utility of this data, the EPA is proposing to remove these requirements. The EPA is also not proposing any changes to the recordkeeping requirements of 40 CFR 98.437 as the current requirements do not require the records to be organized by date in this manner. We have determined that the current recordkeeping requirements are sufficient because they would contain a complete record of imports and exports without requiring an aggregation of this data by date.

W. Subpart RR – Geologic Sequestration of Carbon Dioxide

We are proposing several corrections to subpart RR of Part 98 (Geologic Sequestration of Carbon dioxide). The more substantive corrections, clarifying, and other amendments to subpart RR are discussed in this section. Additional minor

corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to add a requirement for facilities to report the standard or method used to calculate the mass or volume of contents in containers that is redelivered to another facility without being injected into the well.⁴² The addition of this requirement improves consistency within subpart RR, as it was previously only required for facilities using flow meters but not containers. This new reporting element would be used for verification purposes. The proposed data element does not require additional data collection or monitoring by reporters, and as it is not a significant change, would not add burden to reporting entities.

X. Subpart SS – Electrical Equipment Manufacture or Refurbishment

We are proposing clarifying amendments and other corrections to subpart SS of Part 98 (Electrical Equipment Manufacture or Refurbishment); the more substantive corrections, clarifying, and other amendments to subpart SS are discussed in this section. Additional minor corrections to subpart SS are

⁴² The EPA has proposed a data category and confidentiality determination for this revised data element. See the Confidentiality Determinations Memorandum "Proposed data category assignments and confidentiality determinations for (Docket Id. No. EPA-HQ-OAR-2012-0934).

discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934) .

We are proposing to harmonize 40 CFR 98.453(d) and 40 CFR 98.453(h) , clarifying the options available to estimate the mass of SF₆ and PFCs disbursed to customers in new equipment. The proposed revision does not add a new option, but clarifies the existing estimation methods for reporters under subpart SS.

The EPA intended to provide four options for the calculation of SF₆ or PFCs charged into equipment or containers that are sent to customers; these options are based on how the reporter determines the mass of SF₆ or PFCs in equipment or containers. The four options are monitoring the mass flow of the SF₆ or PFCs into the new equipment or cylinders using a flowmeter; weighing containers before and after gas from containers is used to fill equipment or cylinders; and using the nameplate capacity of the equipment either by itself or together with a calculation of the partial shipping charge.

The proposed changes are designed to correct inconsistencies between paragraphs so that all options are clearly identified as available. We are proposing to add text to 40 CFR 98.453(d) to include the options to use the nameplate capacity of the equipment by itself and to use the nameplate capacity along with a calculation of the partial shipping

charge; these options were inadvertently omitted from that paragraph. The provisions of 40 CFR 98.453(h) currently state that reporters "must" use the nameplate capacity of the equipment, or calculate the partial shipping charge, to determine the mass of SF₆ or PFCs disbursed to customers in new equipment. This is inconsistent with the language and intent of 40 CFR 98.453(d), which was to provide facilities multiple options for determining the mass disbursed. Therefore, we are proposing to revise 40 CFR 98.453(h) to clarify that these calculation requirements only apply where reporters choose to estimate the mass of SF₆ or PFCs disbursed to customers in new equipment using the nameplate capacity of the equipment, either by itself or together with a calculation of the partial shipping charge.

Y. Subpart TT – Industrial Waste Landfills

We are proposing several amendments to 40 CFR part 98, subpart TT to clarify and correct calculation methods, provide additional flexibility for certain monitoring requirements, and clarify reporting requirements. The more substantive corrections, clarifying, and other amendments to subpart TT are discussed in this section. Additional minor corrections are discussed in the Table of Revisions (see Docket ID No. EPA-HQ-OAR-2012-0934).

We are proposing to revise the definition of the term "DOC_F" in Equation TT-1 when a 60-day anaerobic biodegradation test is used. In Equation TT-1, "DOC_F" is defined as the fraction of degradable organic carbon (DOC) that is dissimilated to landfill gas. The typical assumption is that half of the DOC will be anaerobically dissimilated and therefore, the default value for "DOC_F" currently used in Equation TT-1 is 0.5. However, the 60-day anaerobic biodegradation test effectively determines the organic carbon content that is anaerobically dissimilated, and as such, represents the product of the terms "DOC_X" and "DOC_F" within Equation TT-1. Therefore, for facilities using the 60-day anaerobic biodegradation test, it can be assumed that all of the measured DOC will be dissimilated (as it was during the test), so that "DOC_F" is 1. We are therefore proposing that the DOC_F have a default value of 1.0 for facilities using the 60-day anaerobic biodegradation test.

We are also proposing similar revisions to Equation TT-7, which is used to determine a waste stream-specific DOC value when a facility performs a 60-day anaerobic biodegradation test. The DOC value from Equation TT-7 is then used as an input to Equation TT-1 for that waste stream. Consistent with our proposed revision of the "DOC_F" term in Equation TT-1, "DOC_F" equals 1 when DOC is determined using the 60-day anaerobic

biodegradation test. As such the " $1/\text{DOC}_F$ " term in Equation TT-7 must equal to 1, so there is no need to include this term in the Equation TT-7.

We are also proposing to delete the term " $1/(\text{MCD}_{\text{control}}/\text{MC}_{\text{control}})$ " from Equation TT-7. This term was erroneously included to correct the measured value of the DOC (i.e., $\text{MCD}_{\text{sample}}/\text{M}_{\text{sample}}$) for the recovery of the control substrate. However, after further review, the EPA determined that the recovery of the control substrate is only used to ensure quality control of the anaerobic biodegradation test (i.e., to verify that the inoculum or sludge from an anaerobic sludge digester used in the test is in fact biologically active) and is therefore not appropriate to include as a correction term in this equation.

We are proposing to revise 40 CFR 98.464(b) and (c) to broaden the provisions to determine volatile solids concentration for historically managed waste streams for the purposes of 40 CFR 98.460(c)(2)(xii) (exemption as an inert waste) so that they may also be used for determining a site-specific DOC value for historically managed waste streams. When we added the 60-day anaerobic biodegradation test in the 2011 Technical Corrections, Clarifying, and Other Amendments (76 FR, 73886; November 2011), we had not considered the impact of those amendments to this section. We did not intend to prevent

facilities from using the 60-day anaerobic biodegradation test for similar waste streams for determining if a waste stream is inert. Furthermore, if a facility tests a similar waste stream and the waste stream is not inert, we did not intend to prevent the facility from using that result as the DOC value for their waste stream for purposes of calculating CH₄ generation and ultimately reporting GHG emissions. The proposed amendments expand the provisions of this section to determining a site-specific DOC value for historically managed waste streams both to assess whether the waste stream qualifies as an inert waste and to use in Equation TT-1 (even when the waste stream does not qualify as inert).

We are proposing to amend 40 CFR 98.466(b)(1) to clarify that the number of waste streams for which Equation TT-1 is used includes the number of "Inert" waste streams disposed of in the landfill.⁴³ Although "Inert" waste streams have a DOC of 0 and therefore do not contribute to the facility's CH₄ generation, 40 CFR 98.463(a) clearly requires the owner or operator to "Apply Equation TT-1 of this section for each waste stream disposed of in the landfill..." Therefore, an owner or operator of an industrial waste landfill that is required to report the

⁴³ The EPA has proposed a data category and confidentiality determination for this revised data element. See the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

emissions must apply Equation TT-1 to their inert waste streams and include these inert waste streams in the number reported in 40 CFR 98.466(b)(1).

As part of the 2011 Technical Corrections, Clarifying, and Other Amendments (76 FR, 73886), we amended Equation TT-4 to become Equation TT-4a and added Equation TT-4b for the calculation of historical waste disposal quantities. However, we neglected to amend the reporting requirements specific to Equations TT-4a and TT-4b in 40 CFR 98.466(c)(4). We also noted that the reporting elements associated with Equations TT-4a or TT-4b were not waste-stream specific and therefore did not need to be reported for each waste stream as indicated by the introduction in 40 CFR 98.466(c). In order to eliminate duplicative reporting requirements and to clarify the reporting requirements when using Equations TT-4a or TT-4b, we are proposing several amendments to 40 CFR 98.466(c). First, we are proposing to revise the introductory text in 40 CFR 98.466(c) to read "Report the following historical waste information" rather than "For each waste stream identified in paragraph (b) of this section, report the following information." Second, we are proposing to move the reporting of the decay rate (k) from paragraph (c)(1) to a new paragraph (b)(5) as this reporting element is more correctly categorized under "waste characterization and modeling information"; we are specifically

indicating that the reporting of the decay rate (k) must be made for each waste stream (as it was previously). Third, we are proposing to clarify that the reporting elements for paragraphs (c)(2) and (c)(3) are for each waste stream (as they were under previously). Fourth, we are proposing to clarify that the reporting elements for Equation TT-4 are specific to reporters using Equation TT-4a; these reporting elements would be reported once for the facility's landfill rather than for each waste stream. Fifth, we are proposing to add a new paragraph (c)(5) to this section to delineate the reporting requirements for reporters using Equation TT-4b; these reporting elements would also be reported once for the facility's landfill rather than for each waste stream. We are also proposing to amend 40 CFR 98.466(d)(3) to read "For each waste stream, the degradable organic carbon..." rather than "The waste stream's degradable organic carbon..." to clarify that these reporting elements must be reported for each waste stream.⁴⁴

To harmonize with the proposed changes to subpart HH, and in order to more accurately reflect the amount of methane oxidized in the surface soil layer of industrial waste landfills, we are proposing to amend the oxidation fraction default value ("OX") in Equation TT-6. Reporters would be

⁴⁴ The EPA is proposing data category assignments and confidentiality determinations for the new and substantially revised data elements in the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

referred to newly proposed Table HH-4 to determine the value for "OX" to be used in Equation TT-6. Please see Section II.Q of this preamble for more detailed explanation.

In addition to adding reporting of the oxidation factor used, we are also proposing clarification of the reporting requirements for CH₄ generation adjusted for oxidation for industrial waste landfills with gas collection systems. Under 40 CFR 98.463(b)(1), we require all industrial waste landfills reporting under Subpart TT to calculate their CH₄ generation, adjusted for oxidation, from the modeled CH₄ (GCH₄ from Equation TT-1) using Equation TT-6. For landfills without gas collection systems, we then require the reporting of the result of this equation in 40 CFR 98.466(g)(1), which is also the annual CH₄ emissions from these landfills. For landfills with gas collection systems, we require the reporting of the requirements in paragraphs 40 CFR 98.466(a) through (f) in addition to 40 CFR 98.346(i). In the cross-reference to 40 CFR 98.346(i) we inadvertently required facilities to report, under 40 CFR 98.346(i)(8), their CH₄ generation adjusted for oxidation based using Equation HH-5 rather than Equation TT-6. While these equations appear identical, the modeled CH₄ generation term is defined as the result of the Equation HH-1 in Equation HH-5 rather than the result of Equation TT-1 as in Equation TT-6. We

never intended to have industrial waste landfills that have gas collection systems to calculate their modeled CH₄ generation using Equation HH-1 (with its default DOC and k parameter values associated with MSW) rather than using Equation TT-1 (with default DOC and k parameter values for industrial wastes). To provide improved clarity in the reporting of CH₄ generation adjusted for oxidation for industrial waste landfills with gas collection systems, we are therefore proposing to amend 40 CFR 98.466(h) to read "For landfills with gas collection systems, in addition to the reporting requirements in paragraphs (a) through (f) of this section, provide: (1) The annual methane generation, adjusted for oxidation, calculated using Equation TT-6 of this subpart, reported in metric tons CH₄; (2) The oxidation factor used in Equation TT-6 of this subpart; and (3) All information required under 40 CFR 98.346(i)(1) through (7) and 40 CFR 98.346(i)(9) through (12)."⁴⁵

Finally, we are proposing changes to Table TT-1 of subpart TT of Part 98. During implementation of Part 98, a question arose regarding the default value for pulp and paper wastes questioning whether the 2006 IPCC Guidelines recommended value of 0.09 instead should be used for wastewater sludges. We

⁴⁵ The EPA has proposed a data category and confidentiality determination for the revised data elements of 40 CFR 98.466(h). See the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

reviewed the 2006 IPCC Guidelines as well as laboratory test data results for pulp and paper wastewater sludges provided by NCASI (see memorandum "Calculations documenting the greenhouse gas emissions from the pulp and paper industry" from R.A. Miner, NCASI, to B. Nicholson, RTI International, dated May 21, 2008, in Docket ID No. EPA-HQ-OAR-2012-0934). Based on the available data, we agree that the industrial sludge default value for DOC of 0.09 appears to provide a more accurate estimate of the DOC than the generic industry defaults currently provided in the rule. Consequently, we are proposing to revise Table TT-1 to include the DOC default value of 0.09 for "Industrial Sludge."

We are also proposing to revise the titles of the industry specific categories in Table TT-1 to note that these industry specific parameters apply to the industry waste streams "(other than sludge)." The addition of the new default DOC value for industrial sludge in Table TT-1 also requires the addition of corresponding k-values. The 2006 IPCC Guidelines do not provide default k-values for industrial wastes (sludge or otherwise); the IPCC Waste Model (a spreadsheet tool to help implement the 2006 IPCC Guidelines for landfills) uses the same k-values for industrial wastes as for bulk MSW. While it is anticipated that sludge generated by different industries will have different decay rates (and therefore different k-values), we have very little data by which to determine industry-specific k-values for

the new default "Industrial Sludge" waste type. The k-values for "Other Industrial Solid Waste" waste type in Table TT-1 were selected based on country-specific default k-values for bulk MSW in U.S. landfills following the general default assumptions used in the IPCC Waste Model. These same k-values (0.02, 0.04, and 0.06 for dry, moderate, and wet climates, respectively) are being proposed as the default k-values for the new "Industrial Sludge" waste type for the same reasons (i.e., based on country-specific default k-values for bulk MSW in U.S. landfill following general default assumptions used in the IPCC Waste model). We specifically request comment from reporters on these proposed k-values and we further request that the commenters provide any applicable data to support comments.

Z. Subpart UU – Injection of Carbon Dioxide

We are proposing technical amendments to 40 CFR part 98, subpart UU (Injection of Carbon Dioxide) to clarify provisions and improve verification of reported GHG data. The more substantive corrections, clarifying, and other amendments to subpart UU are discussed in this section. Additional minor corrections are discussed in the Table of Revisions for this rulemaking (see Docket ID No. EPA-HQ-OAR-2012-0934).

The EPA is proposing to add a requirement to subpart UU for a facility to report the purpose of CO₂ injection (i.e., Research and Development (R&D) project exemption from subpart

RR, enhanced oil or gas recovery, acid gas disposal, or some other reason) to aid the agency in verification of data reported under subpart UU and to allow the EPA to understand the nature of the CO₂ injection operations for the purposes of data analysis to inform policy development.⁴⁶ We do not anticipate that this change would significantly increase burden for reporters.

We are also proposing to add a requirement for facilities to report the standard or method used to calculate the parameters for CO₂ received in containers. This new reporting element will be used for verification purposes.⁴⁷ The proposed data element does not require additional data collection or monitoring from reporters, and as it is not a significant change, will not add burden to reporting entities.

AA. Other Technical Corrections

In addition to the corrections, clarifying, and other amendments proposed in Sections II.A through II.Z of this preamble, we are proposing minor corrections to subparts E, G, O, S, V, and II of Part 98. The proposed changes to these subparts are provided in the Table of Revisions for this rulemaking, available in Docket ID No. EPA-HQ-OAR-2012-0934, and

⁴⁶ The EPA has proposed category assignments and confidentiality determinations for new and revised data elements in the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

⁴⁷ *Id.*

include clarifying requirements to better reflect the EPA's intent, corrections to calculation terms or cross-references that do not revise the output of calculations, harmonizing changes within a subpart (such as changes to terminology), simple typo or error corrections, and removal of redundant text.

III. Schedule for the Proposed Amendments

A. When would the proposed amendments become effective?

The EPA is planning to address the comments on these proposed changes and publish any final amendments before the end of 2013. This section describes when the proposed amendments would become effective for existing reporters and new facilities that could be required to report as a result of the proposed amendments to Table A-1 of subpart A. This section also discusses proposed amendments to subpart A for the use of best available monitoring methods (BAMM) by new reporters and for options considered for revising emissions estimates due to the change in GWPs for 2010, 2011, and 2012 reports previously submitted by existing reporters.

1. Existing Reporters

We have determined that it would be feasible for existing reporters to implement the proposed changes for the 2013 reporting year because these changes are consistent with the data collection and calculation methodologies in the current rule. The proposed revisions primarily provide additional

clarifications or flexibility regarding the existing regulatory requirements, would not add new monitoring requirements, and would not substantially affect the information that must be collected. Where calculation equations are proposed to be modified, the changes clarify equation terms or simplify the calculations and do not require any additional data monitoring. The owners or operators are not required to actually submit reporting year 2013 reports until March 31, 2014, which is several months after we expect a final rule based on this proposal to be finalized, thus providing an opportunity for reporters to adjust to any finalized amendments.

We are proposing that existing GHGRP reporters begin using the updated GWPs in Tables A-1 for their reporting year 2013 annual reports, which must be submitted by March 31, 2014. In keeping with the March 15, 2012 UNFCCC decision, the Inventory submitted to the UNFCCC in 2015 must use AR4 GWP values (see Section II.A.1.a of this preamble). Development of the 2015 Inventory will rely in part on data from the GHGRP reports submitted in 2014 to supplement the top-down national estimate. Existing GHGRP reporters would also begin calculating facility GHG emissions or supply using the proposed GWPs for the additional F-GHGs discussed in Section II.A.1.c of this preamble for their reporting year 2013 annual reports. The proposed amendments would pose a minimal burden to existing reporters.

Part 98 already requires that existing reporters report these F-GHGs in metric tons of chemical emitted or supplied.⁴⁸ Therefore, facilities are already collecting information on emissions and supply for these substances, and in some cases have provided GWP estimates for these compounds. Furthermore, the proposed amendments only provide a factor to convert emissions to CO₂e, and do not change the type of data collected. The EPA also does not anticipate that the proposed GWPs would require any existing reporters to report under new subparts; such a reporter, if one exists, would not be required to report for any past years under any subparts for which the reporter's emissions newly exceed a reporting threshold. Therefore, we anticipate that there is no significant burden for existing reporters to use the proposed GWP values for reporting year 2013.

In some cases we are proposing revisions to reporting requirements to clarify requirements or to make harmonizing changes within a subpart or between subparts under Part 98. The EPA anticipates that the proposed reporting requirements are either already being collected by reporters or would be readily available to reporters. For example, we are revising reporting requirements to 40 CFR part 98, subpart A to include additional

⁴⁸ The sole exception is Subpart L, under which the requirement to report these F-GHGs on a mass basis is deferred for reporting years 2011 and 2012 (and 2013, under this proposal), but reporters are required to keep records of the data and calculations used to estimate aggregate emissions in CO₂e for the entire facility (77 FR 51477, August 24, 2012).

data for identification purposes, such as the latitude and longitude for facilities without a physical address, or the ORIS code for power generation units (an identifier assigned by the Energy Information Administration). In the case of 40 CFR part 98, subpart K (Ferroalloy Production), we are proposing to add a requirement to report the annual process CH₄ emissions (in metric tons) from each EAF where the carbon mass balance procedure is used to measure emissions. This reporting requirement is an aggregate of data that is currently being monitored from each EAF. Similarly, under 40 CFR part 98, subpart Y (Petroleum Refineries), we are clarifying the reporting requirements by adding a provision to specify that when the process vent calculation method using Equation Y-19 is used to calculate emissions for asphalt blowing operations or delayed coking units, the facility must report the information required under 40 CFR 98.256(1)(5), which are the reporting requirements for process vents. This is a clarification of the reporting parameters required when an alternate calculation methodology is used. In the case of 40 CFR part 98, subpart Z (Phosphoric Acid Production), we are proposing to require reporting of the number of times missing data procedures were used to estimate CO₂ content. Because the proposed changes to these subparts would not require new monitoring or data collection but could be determined from existing monitoring and

recordkeeping, the EPA has determined that it would be feasible to include these new reporting requirements in 2013 reports.

In the case of subpart N (Glass Production), we are proposing to revise the monitoring methods used to measure carbonate-based mineral mass-fractions to allow for more accurate measurement methods and to add flexibility for reporters. The proposed amendments would specify that reporters determining the carbonate-based mineral mass fraction must use sampling methods that specify X-ray fluorescence, instead of the current methods that use inductively coupled plasma or atomic absorption. For measurements made in the emission reporting year 2013 or prior years, reporters would continue to have the option to use the current monitoring methods in Part 98. This change would allow reporters flexibility in choosing a sampling method (since multiple X-ray fluorescence methods are available) while ensuring that more accurate available measurement methods are applied in future reporting years. These facilities would have the option, but not be required, to use the newly proposed option for the reporting year 2013 reports submitted to the EPA in 2014.

In some cases, we are proposing to require reporting of additional data elements to improve verification of the reported GHGs emitted or supplied. For example, for 40 CFR part 98, subpart FF (Underground Coal Mines), we are proposing to

substantiate the data collected for identification of each well and shaft by adding a requirement to report the start date and close date of each well or shaft and the number of days the well or shaft was in operation during the reporting year. In the case of subpart UU (Injection of Carbon Dioxide), we are proposing to require reporting of the purpose of CO₂ injection, whether the facility received a Research and Development project exemption from reporting under subpart RR of Part 98 for the reporting year, and the start and end dates of the exemption, if applicable. The proposed changes would not significantly burden reporters or affect reporting year 2013 reports because this information is expected to be readily available to reporters as part of their standard recordkeeping and would not require additional monitoring or recordkeeping for 2013 reports.

In the case of 40 CFR part 98, subpart NN (Suppliers of Natural Gas and Natural Gas Liquids), we are proposing a change to Equation NN-5 to better reflect actual operating conditions. We are proposing to replace Equation NN-5 with two equations, NN-5a and NN-5b, with harmonizing changes to Equation NN-6. The proposed equations would allow for the use of different emission factors for natural gas that is stored and for natural gas that bypasses the city gate, such as natural gas received from local production. We are proposing harmonizing changes to the reporting requirements to specify the quantity of gas that

bypasses the city gate and the net quantity of gas that is placed into or withdrawn from on-system storage during the reporting year. The proposed changes do not substantially revise the calculation methodology, but are changes that would provide more accurate GHG estimates in situations where the LDC receives several different streams of natural gas with different characteristics. Furthermore, the proposed changes do not revise the information that must be collected for recordkeeping or reporting. Therefore, we have concluded that under the proposed amendments, existing sources could use the same information that they have been collecting under the current Part 98 and readily available information for each subpart to determine applicability and to calculate and report GHG emissions for reporting year 2013.

The EPA specifically seeks comment on the conclusion that it is appropriate to implement these amendments and incorporate the requirements in the data reported to the EPA by March 31, 2014. Further, we specifically seek comment on whether there are specific subparts or amendments for which this timeline may not be feasible or appropriate due to the nature of the proposed changes or the way in which data have been collected thus far. We request that commenters provide specific examples of how and why the proposed implementation schedule would not be feasible.

2. New Reporters

As a result of the proposed amendments to the GWPs in Table A-1 of subpart A, some facilities that were never previously required to report under Part 98 may be required to report (see Section V.A of this preamble). Given that a final rule based on this proposed rule would not be finalized until the second half of 2013, we have determined that it would not be feasible for these new facilities to acquire, install, and calibrate monitoring equipment, collect data, and implement these changes for reporting year 2013. Therefore, we are proposing that new reporters who would be required to report under Part 98 as a result of the proposed changes to Table A-1 would begin collecting data on January 1, 2014 for the 2014 reporting year. New reporters would be required to submit their first reports, covering the 2014 reporting year, on March 31, 2015. The intended schedule (including publication of any final rule by the end of 2013) would allow time for new reporters to acquire, install, and calibrate monitoring equipment for the 2014 reporting year.

We are also proposing to add provision 40 CFR 98.3(1) to subpart A to allow new reporters who would be required to report as a result of the proposed new or revised GWPs to have the option of using BAMM from January 1, 2014 to March 31, 2014 for any parameter that cannot reasonably be measured according to the monitoring and QA/QC requirements of a relevant subpart. The

EPA understands that because any final rule based on this proposal likely would not be promulgated until the fall of 2013, facilities that do not already have the monitoring systems required by the rule in place might not have time to install and begin operating them by January 1, 2014. Therefore, we are proposing that reporters be allowed to use BMM during the January 1, 2014 to March 31, 2014 time period without formal request to the EPA. Reporters would also have the opportunity to request an extension for the use of BMM beyond March 31, 2014; those owners or operators must submit a request to the Administrator by 60 days after the effective date of the final rule. The EPA anticipates granting approval for BMM no later than December 31, 2014. The EPA has concluded that the time period allowed under this schedule (including the provision for facility-specific requests) is reasonable and will allow facilities that do not currently have the required monitoring systems sufficient time to begin implementing the monitoring methods required by the rule. The proposed schedule would allow approximately six months to prepare for data collection, which is consistent with existing BMM provisions provided under subpart A of Part 98. By allowing the additional time, many facilities may also be able to install any necessary equipment during other planned (or unplanned) process unit downtime, thus avoiding process interruptions.

B. Options Considered for Revision and Republication of
Emissions Estimates for Prior Year Reports

The EPA is proposing to independently recalculate revised CO₂e emissions from the 2010, 2011, and 2012 reporting year emissions or supply for each facility using the revised GWPs in Table A-1. We considered two options for revising the CO₂e emission estimates from annual reports for reporting years 2010, 2011, and 2012 using the proposed GWP values in Table A-1. Revision of CO₂e emission estimates in reports for years 2010, 2011, and 2012, either by reporters or by the EPA, would allow for the comparison of emission data submitted for those reporting years with data submitted in 2013 and future reporting years and ensure that published annual GHG reports are based on a common metric. This would allow the EPA and the public to more efficiently analyze changes in GHG emissions and industry trends in a time series.

Option 1: Under this option, which is not preferred by EPA, reporters who have submitted annual reports for the reporting years 2010, 2011, and 2012 would be required to resubmit their prior year reports using the revised GWPs. Under this option, reporters would use the built-in calculation methods in the EPA's Electronic Greenhouse Gas Reporting Tool (e-GGRT) to convert reported quantities of GHGs to CO₂e per the requirements

of 40 CFR 98.2(b)(4).⁴⁹ To adjust prior year reports, the system would recalculate facility GHG emissions using the revised GWP values in Table A-1, yielding a new CO₂e for each GHG in the annual report.⁵⁰ Reporters would then recertify and sign the reports as required by 40 CFR 98.4(e) and resubmit the reports through e-GGRT.

The proposed revised GWP values in Table A-1 will likely result in changes to the CO₂e estimates of GHGs emitted or supplied in previous reporting years. In most cases, this will result in higher estimates of CO₂e emitted or supplied, rather than lower estimates. Reporters may desire to review and certify the revised emission estimates prior to data publication by the EPA. So we have included this option for comment. This option would give reporters greater control over the republication of their data, and emission or supply totals would be certified by reporters. However, this option would present an additional burden on reporters. The EPA calculates that existing reporters would incur a total one-time cost of \$3.5 million for

⁴⁹ For reporters using the e-GGRT web forms, the system currently automatically applies the GWP values in Table A-1 of subpart A to reported facility emissions (metric tons) to convert emissions to CO₂e, according to the requirements of Subpart A (General Provisions).

⁵⁰ For reporters using the XML schema to submit annual GHG reports, reporters would apply the revised GWP values in Table A-1 of subpart A in their submitted XML reports to recalculate emission or supply estimates, following the XML reporting instructions provided through e-GGRT. For these reporters, the system would validate the CO₂e estimates provided in the XML report against automatically calculated e-GGRT values, using the revised GWPs in Table A-1.

resubmittal and recertification of 2010, 2011, and 2012 reports. This represents a one-time cost for 2010 reporters of \$347 per facility for the resubmittal of 2010, 2011, and 2012 reports, and a cost of \$231 per facility for 2011 reporters for the resubmittal of 2011 and 2012 reports. In addition, the EPA recognizes that some facilities may no longer be required to report under Part 98 or may have ceased operations. Obtaining revised emissions estimates from these facilities could be difficult; therefore, the EPA may not be able to revise the complete data set for prior reporting years. For these reasons, the EPA does not prefer this option.

Option 2: The EPA would independently recalculate revised CO₂e emissions from the 2010, 2011, and 2012 reporting year emissions or supply for each facility using the revised GWPs in Table A-1. Under this scenario, through e-GGRT, each reporter would be able to see the EPA's revision of its emission or supply totals in previously submitted 2010, 2011, and 2012 reports before that information is publically available. However, although the reporter would be able to view the estimate, the reporter would not be able to comment on or change the revised estimate. The EPA would publish the revised estimates with a caveat explaining how the estimates were obtained and explaining that the emission values are not those submitted and certified by reporters. While the calculation is

very straightforward for most reporters, because subpart L reporters have not reported the specific compounds that make up their emissions, there could be some uncertainty associated with the revisions to subpart L emission data if option 2 is selected.

This option would allow the EPA to publish revised emission and supply totals without increasing burden on reporters. This option would remove the need for reporters to resubmit and recertify revised reports. However, Option 2 would not give reporters the opportunity to provide feedback on their individual revised emissions or supply totals, or allow them to certify the amended totals at any point before or after republication. As reporters would be unable to submit revised emission estimates or comment on the estimation methods used to calculate the updated CO₂e totals, they would have less control over the revised data. Although Option 1 would give reporters more input in the revised emission or supply totals provided to the public, we do not anticipate that the benefits of requiring data resubmission and certification would justify the increased burden on reporters discussed above. Option 2 would not present any additional burden for reporters. Option 2 would allow the EPA to publish revised emission and supply totals for all facilities which submitted a report for 2010, 2011, and 2012, including facilities which have ceased operations or which are

no longer required to report. This approach would allow the EPA to reconstruct the complete data set for prior year reports for comparison to data reported for 2013 and future years. In light of these considerations, the EPA prefers Option 2. The EPA seeks comment on the two options. Specifically, we request comment on the need for review and certification of revised emission estimates by reporters and whether revised calculations prepared by the EPA, as proposed in Option 2, would be sufficient for publication.

IV. Confidentiality Determinations

A. Overview and Background

In this notice we are proposing confidentiality determinations for the new or substantially revised reporting data elements (i.e., the data required to be reported would change under the proposed revision) in the proposed subpart rule amendments, except for inputs to equations.⁵¹ For information on the history of confidentiality determinations for Part 98 data elements, see the following notices:

- 75 FR 39094, July 7, 2010; hereafter referred to as the "July 7, 2010 CBI proposal." Describes the data categories EPA developed for the Part 98 data elements.
- 76 FR 30782, May 26, 2011; hereafter referred to as the "2011 Final CBI Rule." Assigned data elements to data categories and published the final CBI determinations for

⁵¹ As discussed later in the preamble, we propose to assign certain new or substantially revised data elements to the "inputs to emission equations" category but do not propose confidentiality determinations for these data elements.

the data elements in 34 Part 98 subparts, except for those data elements that were assigned to the "Inputs to Emission Equations" data category.

- 77 FR 48072, August 13, 2012, hereafter referred to as "2012 Final CBI Determinations Rule." Finalized confidentiality determinations for data elements to be reported under nine subparts I, W, DD, QQ, RR, SS, UU; except for those data elements that are inputs to emission equations, and finalized confidentiality determinations for new data elements added to subparts II and TT in the November 29, 2011 Technical Corrections Notice (76 FR 73886).
- 77 FR 51477, August 24, 2012; hereafter referred to as the "2012 Technical Corrections and Subpart L Confidentiality Determinations." Finalized confidentiality determinations for new data elements added to subpart L.

In this action, the EPA is proposing confidentiality determinations for new or substantially revised data elements. The new and substantially revised data elements result from the proposed corrections, clarifying, and other amendments that are described in Section II of this preamble. These proposed confidentiality determinations would be finalized based on public comment. The EPA currently plans to finalize these determinations at the same time the proposed rule amendments described in Sections II and III of this preamble are finalized. We are not proposing new confidentially determinations for data reporting elements that may be minimally revised for clarification or to correct insignificant errors, where the change does not require an additional or different data element to be reported. The final confidentiality determinations the EPA

has previously made for these data elements are unaffected by this proposed amendment and continue to apply.

B. Approach to Proposed Confidentiality Determinations for New or Substantially Revised Data Elements

In this action, we are proposing to add or substantially revise data reporting requirements in subparts A, H, K, X, Y, Z, AA, FF, HH, NN, QQ, RR, TT, and UU. We propose to assign each of the newly proposed or substantially revised data elements in these subparts to one of the direct emitter or supplier data categories created in the 2011 Final CBI Rule (76 FR 30782, May 26, 2011). In the 2011 Final CBI Rule, the EPA made categorical confidentiality determinations for data elements assigned to eight direct emitter data categories and eight supplier data categories. For two direct emitter data categories, "Unit/Process 'Static' Characteristics that Are Not Inputs to Emission Equations" and "Unit/Process Operating Characteristics that Are Not Inputs to Emission Equations," the EPA determined in the 2011 Final CBI Rule that the data elements assigned to those categories are not emission data but did not make categorical CBI determinations. Rather, the EPA made CBI determinations for individual data elements assigned to these two data categories. Similarly, for three supplier data categories, "GHGs Reported," "Production/Throughput Quantities and Composition," and "Unit/Process Operating Characteristics,"

the EPA determined in the 2011 Final CBI Rule that the data elements assigned to those categories are not emission data but did not make categorical CBI determinations; instead the EPA made CBI determinations for individual data elements assigned to these two data categories. In subsequent amendments to Part 98,⁵² the EPA assigned each new or substantially revised data element to an appropriate data category created in the 2011 Final CBI Rule and applied the categorical confidentiality determination if one was established in the 2011 Final CBI Rule. If a data element was assigned to one of the two direct emitter or three supplier data categories identified above that do not have categorical determinations, the EPA made individual CBI determinations. With respect to data elements for which the revisions did not change the type of data to be reported, their categorical assignments and confidentiality determinations (whether categorical or individual determinations) are not affected by this proposed amendment and therefore remain unchanged. The EPA did not make final confidentiality determinations for data elements assigned to the inputs to emission equations category either in the 2011 Final CBI rule or any subsequent Part 98 rulemaking. We are following the same approach in this proposed rule. Specifically, we are proposing to assign new or substantially revised data elements in the

⁵² See, e.g., 77 FR 48072 (August 13, 2012) and 77 FR 51477 (August 24, 2012).

proposed amendments to the appropriate direct emitter or supplier data category.⁵³ For new or substantially revised data elements being assigned to categories with categorical confidentiality determinations, we propose to apply the categorical determinations made in the 2011 Final CBI Rule to the assigned data elements. For new or substantially revised reporting elements assigned to the "Unit/Process 'Static' Characteristics that Are Not Inputs to Emission Equations" and the "Unit/Process Operating Characteristics that Are Not Inputs to Emission Equations" direct emitter data categories or the "Unit/Process Operating Characteristics" supplier data categories, consistent with our approach toward data elements previously assigned to these data categories, we propose that these data elements are not emission data, and are making individual CBI determinations for the data elements in these categories.

Please see the memorandum titled "Proposed data category assignments and confidentiality determinations for new and substantially revised data elements in the proposed '2013 Revisions to the Greenhouse Gas Reporting Rule and Confidentiality Determinations for New or Substantially Revised

⁵³ Proposed determination is not needed for two data elements proposed for subpart Y (40 CFR 98.256(j)(10) and 40 CFR 98.256(k)(6)), because they refer to an existing data element (40 CFR 98.256(l)(5)) for which a CBI determination has already been finalized.

Data Elements' " ("Confidentiality Determinations Memorandum") in Docket EPA-HQ-OAR-2012-0934 for a list of the proposed new or substantially revised data elements, their proposed category assignments, and their proposed confidentiality determinations (whether categorical or individual) except for those assigned to the inputs to equations category. Section IV.C of this preamble discusses the proposed CBI determinations and supporting rationale for individual data elements.

C. Proposed Confidentiality Determinations for Individual Data Elements in Two Direct Emitter Data Categories and Two Supplier Data Categories

The EPA is proposing individual CBI determinations for 16 data elements assigned to the "Unit/Process 'Static' Characteristics that Are Not Inputs to Emission Equations", "Unit/Process Operating Characteristics that Are Not Inputs to Emission Equations" direct emitter data categories and the "Production/Throughput Quantities and Composition" and "Unit/Process Operating Characteristics" supplier data categories. (There are no new data elements proposed to be assigned to the "GHGs Reported" supplier data category.) These data elements consist of three new data elements in the direct emitter subpart FF and eight in the supplier subpart UU. We are also proposing individual CBI determinations for five substantially revised data elements in the subparts Z, NN, TT,

and QQ. Table 9 of this preamble provides the category assignment and proposed rationale for the proposed determinations.

Table 9. Data Elements Proposed to be Assigned to Data Categories without Categorical Determinations and Proposed CBI Determinations (Subparts Z, NN, FF, QQ, TT, and UU)

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
<i>Data Elements Proposed to be Assigned to the "Unit/process Static Characteristics that Are Not Inputs to Emission Equations" Direct Emitter Data Category</i>			
98.266 (b)	Revised	Annual phosphoric acid production capacity	We are not proposing a determination for this data element at this time. This data element is being revised from "permitted production capacity" to "production capacity". As discussed in the 2011 Final CBI Rule (76 FR 30782), the EPA reviewed available capacity information in the "Unit/process Static Characteristics that Are Not Inputs to Emission Equations" data category and determined that these data elements may not be publically available for all facilities and may be competitively sensitive. Revising the current data element to "production capacity" would require reporting of actual production capacity in lieu of permitted production capacity. Although this information in some cases is publicly available (e.g., Title V permits, NEI), this data may still be competitively sensitive for other facilities. No determination is being proposed at this time; case-by-case determinations will be made when necessary.
<i>Data Elements Proposed to be Assigned to the "Unit/process Operating Characteristics that Are Not Inputs to Emission Equations" Direct Emitter Data Category</i>			
98.326 (r) (2)	New	Start date of each well and shaft.	We are proposing that these data elements are not emission data and not CBI. These proposed data elements would provide additional identification and descriptive information for each well or shaft.
98.326 (r) (2)	New	Close date of each well and shaft.	

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
98.326(r) (3)	New	Number of days each well or shaft was in operation during the reporting year.	<p>These data elements reveal general information about the operating characteristics of the reporting facility and would be assigned to the "Unit/process Operating Characteristics that Are Not Inputs to Emission Equations" data category. We are proposing that these data elements not be considered CBI because they characterize the total operation period of each well or shaft. None of these data elements reveal information regarding the production characteristics or production rates of any individual well or shaft. Furthermore, these data elements are generally publicly available. For example, facilities currently report shaft operating periods to the Mine and Safety Health Administration (MSHA). Additionally, facilities are often required to report well operation periods to state agencies for other regulatory purposes. Therefore, these data elements are not anticipated to be sensitive information and public disclosure of these data elements is not likely to cause substantial competitive harm to the reporting facility.</p>
98.466(b) (1)	Revised	The number of waste streams for which Equation TT-1 is used.	<p>We are proposing that this data element is not emission data and not CBI. This data element is being revised to include "inert" waste streams. The addition of "inerts" to the reporting requirement clarifies that inert waste streams must be reported in the total number of waste streams used to calculate modeled CH₄ generation, which may change the value reported. This data element does not disclose any information about the design or operating characteristics of production processes, historical production volumes, or any other production related information about the landfill that competitors could use</p>

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
			to discern sensitive information. Therefore we are proposing a determination of "not emission data and not CBI".
<i>Data Elements Proposed to be Assigned to the "Production/Throughput Quantities and Composition" Supplier Data Category</i>			
98.406(b) (2)	Revised	LDCs: Annual volume of natural gas placed into storage.	We are proposing that this data element is not CBI. The change to this data element is proposed in order to harmonize the reported data with the change to the equations in subpart NN. The change clarifies that the volume to be reported is the volume referenced as Fuel ₁ in the Equation NN-5a. The volume reported is not expected to change as a result of the proposed revision. As discussed in the 2011 Final CBI Rule, the EPA does not consider LDC-level production/ throughput data as CBI because many of the same data elements are already collected and released annually by the Energy Information Administration (EIA). Therefore, we are proposing that the data element is not CBI.
98.436(a) (6) (iii)	Revised	If the reporter does not know the identity and the mass of the F-GHGs within the closed cell foam: For closed cell foams that are not imported inside of equipment, the density in CO ₂ e of the F-GHGs in the foam.	We are proposing that these data elements are CBI. These data elements were previously assigned to the "Production /Throughput Quantities and Composition" data category and assigned a "CBI" determination in the 2012 Final CBI Determinations Rule. The proposed change to these data elements is a correction to match the reported data element to the units required to be reported. The change proposed is a change from "mass in CO ₂ e" to "density in CO ₂ e". The units specified for the data element are kg CO ₂ e/cubic foot, and are unchanged in this proposal. These data elements reveal importer- and exporter-level production information (density of the fluorinated gas within the foam) and the disclosure of these data elements would likely cause substantial harm to the competitive positions of businesses
98.436(a) (6) (iii)	Revised	If the reporter does not know the identity and the mass of the F-GHGs within the closed cell foam: For closed cell foams that are not exported inside of equipment, the	

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
		density in CO ₂ e of the F-GHGs in the foam.	reporting these data. Therefore, we are proposing to assign these elements to the "Production /Throughput Quantities and Composition" data category and a determination that the data element is CBI.
<i>Data Elements Proposed to be Assigned to the "Unit/Process Operating Characteristics" Supplier Data Category</i>			
98.476(e) (1)	New	Whether the facility received a Research and Development project exemption from reporting under 40 CFR part 98, subpart RR for the reporting year.	These data elements reveal general information about the operating characteristics of the reporting facility and are proposed to the "Unit/Process Operating Characteristics" supplier data category. We are proposing that these data elements are not CBI. These proposed data elements are based on the compliance requirements for R&D facilities under subpart RR that are not considered sensitive information by the EPA. We are proposing that these data elements are non-CBI because they would not reveal any information about production quantities, process, or specific R&D projects that could cause competitive harm, but only provide information about whether the facility received an approved exemption from other subpart-specific requirements under Part 98 and the duration of the exemption.
98.476(e) (1)	New	If you received a Research and Development project exemption from reporting under 40 CFR part 98, subpart RR for the reporting year, the start date of the exemption.	
98.476(e) (1)	New	If you received a Research and Development project exemption from reporting under 40 CFR part 98, subpart RR for the reporting year, the end date of the exemption.	
98.476(e) (2)	New	Whether the facility includes a well or group of wells where a CO ₂ stream was injected into	The proposed data elements would reveal general information about the operating characteristics of the reporting facility and would be assigned to the "Unit/Process Operating Characteristics" supplier data category, which contains

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
		subsurface geologic formations to enhance the recovery of oil during the reporting year.	similar data elements. We are proposing that these data elements are not CBI. The proposed data elements would provide additional information on the purpose of the CO ₂ injection on a facility-wide basis. The proposed data elements would not reveal any specific information about the quantities of CO ₂ received or injected at specific wells or information about the production that could cause competitive disadvantage. We are proposing that these data elements are not considered CBI because they do not reveal any detailed information that is likely to cause competitive harm if publicly released.
98.476(e) (3)	New	Whether the facility includes a well or group of wells where a CO ₂ stream was injected into subsurface geologic formations to enhance the recovery of natural gas during the reporting year.	
98.476(e) (4)	New	Whether the facility includes a well or group of wells where a CO ₂ stream was injected into subsurface geologic formations for acid gas disposal during the reporting year.	
98.476(e) (5)	New	Whether the facility includes a well or group of wells where a CO ₂ stream was injected for a purpose other than those listed in (e) (1) through (4) of 40 CFR 98.476.	
98.476(e) (5)	New	The purpose of the injection, if you injected	

Citation	New or Revised Data Element	Data element	Rationale for the proposed CBI determination
		CO ₂ for a purpose of than those listed in paragraph (e) (1) through (4) of 40 CFR 98.476.	

D. Proposed New Inputs to Emission Equations

As discussed in Section IV.C of this preamble, the EPA is proposing category assignment for the new and substantially revised data elements. As shown in the Confidentiality Determinations Memorandum (see Docket Id. No. EPA-HQ-OAR-2012-0934), the EPA is proposing to assign 13 new data elements to the "inputs to emission equations category": two in subpart FF, five in subpart HH, and six in subpart TT. The EPA had previously deferred the reporting deadlines for inputs to emissions equations until March 2013 for some data elements and March 2015 for others to allow EPA sufficient time to conduct an "in-depth evaluation of the potential impact from the release of inputs to equations" (76 FR 53057 and 53060, August 25, 2011); (77 FR 48072, August 13, 2012). We are not proposing to defer the reporting of these 13 data elements. The EPA has conducted an evaluation of these inputs following the process outline in the memorandum "Process for Evaluating and Potentially Amending Part 98 Inputs to Emission Equations" (Docket ID EPA-HQ-OAR-2010-0929), which accompanied the Final Deferral Rule (76 FR

53057). This evaluation is summarized in the memorandum "Summary of Evaluation of 'Inputs to Emission Equations' Data Elements Proposed to be Added with the 2013 Revisions to the Greenhouse Gas Reporting Rule." (See Docket ID No. EPA-HQ-OAR-2012-0934.) Because the EPA has completed the above mentioned evaluation for these 13 data elements, EPA does not see a need to defer their reporting. Accordingly, under this proposed amendment, these data elements would be reported in 2014 along with the rest of the proposed changes.

E. Request for Comments on Proposed Category Assignments and Confidentiality Determinations

For the CBI component of this rulemaking, we are soliciting comment on the following specific issues. First, we specifically seek comment on the proposed data category assignment for each of the new or substantially revised data elements in the proposed amendments to subparts A, H, K, X, Y, Z, AA, FF, HH, NN, QQ, RR, TT, and UU.

If you believe that the EPA has improperly assigned certain new or substantially revised data elements in these subparts to any of the data categories established in the 2011 Final CBI Rule, please provide specific comments identifying which of the new data elements may be mis-assigned along with a detailed explanation of why you believe them to be incorrectly assigned and in which data category you believe they belong. In addition,

if you believe that a data element should be assigned to one of the five categories that do not have a categorical confidentiality determination, please also provide specific comment along with detailed rationale and supporting information on whether such data element does or does not qualify as CBI.

We seek comment on the proposed confidentiality status of the new or substantially revised data elements in the direct emitter data categories "Unit/Process 'Operating' Characteristics that Are Not Inputs to Emission Equations" and "Unit/Process 'Static' Characteristics that Are Not Inputs to Emission Equations" and the supplier data categories "Production/Throughput Quantities and Composition" and "Unit/Process Operating Characteristics." By proposing confidentiality determinations prior to data reporting through this proposal and rulemaking process, we provide potential reporters an opportunity to submit comments, in particular comments identifying data they consider sensitive and their rationales and supporting documentation; this opportunity is the same opportunity that is afforded to submitters of information in case-by-case confidentiality determinations. In addition, it provides an opportunity to rebut the Agency's proposed determinations prior to finalization. We will evaluate the comments on our proposed determinations, including claims of confidentiality and information substantiating such claims,

before finalizing the confidentiality determinations. Please note that this will be reporters' only opportunity to substantiate a confidentiality claim. Upon finalizing the confidentiality determinations of the data elements identified in this rule, the EPA will release or withhold these data in accordance with 40 CFR 2.301, which contains special provisions governing the treatment of Part 98 data for which confidentiality determinations have been made through rulemaking.

When submitting comments regarding the confidentiality determinations we are proposing in this action, please identify each individual proposed new or revised data element you do or do not consider to be CBI or emission data in your comments. Please explain specifically how the public release of that particular data element would or would not cause a competitive disadvantage to a facility. Discuss how this data element may be different from or similar to data that are already publicly available. Please submit information identifying any publicly available sources of information containing the specific data elements in question. Data that are already available through other sources would likely be found not to qualify for CBI protection. In your comments, please identify the manner and location in which each specific data element you identify is publicly available, including a citation. If the data are

physically published, such as in a book, industry trade publication, or federal agency publication, provide the title, volume number (if applicable), author(s), publisher, publication date, and International Standard Book Number (ISBN) or other identifier. For data published on a website, provide the address of the website and the date you last visited the website and identify the website publisher and content author.

If your concern is that competitors could use a particular data element to discern sensitive information, specifically describe the pathway by which this could occur and explain how the discerned information would negatively affect your competitive position. Describe any unique process or aspect of your facility that would be revealed if the particular proposed new or revised data element you consider sensitive were made publicly available. If the data element you identify would cause harm only when used in combination with other publicly available data, then describe the other data, identify the public source(s) of these data, and explain how the combination of data could be used to cause competitive harm. Describe the measures currently taken to keep the data confidential. Avoid conclusory and unsubstantiated statements, or general assertions regarding potential harm. Please be as specific as possible in your comments and include all information necessary for the EPA to evaluate your comments.

V. Impacts of the Proposed Rule

This section of the preamble examines the costs and economic impacts of the proposed rulemaking and the estimated economic impacts of the rule on affected entities, including estimated impacts on small entities.

A. Impacts of the Proposed Amendments to Global Warming Potentials

There are two primary reasons that Part 98 requires direct emitters and suppliers of GHGs to use the GWP values in Table A-1 to subpart A to calculate emissions (or supply) of GHGs in CO₂e. The first is to help determine whether the facility meets a CO₂e-based threshold and is required to report under Part 98. The second is to help calculate total facility emissions for submittal in the annual report. A change to the GWP for a GHG will change the calculated emissions (in CO₂e) of that gas. Therefore, the proposed amendments could affect both the number of facilities required to report under Part 98 and the quantities of GHGs reported.

For most GHGs whose GWPs we are proposing to amend, the proposed AR4 GWP values are greater than the GWP values in the current Table A-1. Therefore, the proposed amendments would likely result in higher reported emissions of CO₂e for facilities that emit these gases. Although the proposed

amendments would result in an increase in reported emissions for many facilities that currently submit a report, using the proposed GWPs would have no effect on the cost of monitoring and recordkeeping and, therefore, no significant impact for reporters.

For the additional F-GHGs and associated GWPs we are proposing to include in Table A-1, we do not anticipate significant impacts for existing reporters. Per 40 CFR 98.3(c), facilities are required to report annual CO₂e emissions or supply, using Equation A-1, for each GHG with a GWP in Table A-1. The proposed amendments to subpart A would require Part 98 reporters to include emissions of the new F-GHGs in Table A-1 (in CO₂e) in their facility totals in their annual reports. With the addition of the new F-GHGs, we expect the quantities of CO₂e reported to increase for reporters that previously emitted, produced, imported, or exported the proposed compounds and reported the annual quantities (metric tons) of these gases in their 2010, 2011, or 2012 reports, but who were not required to include the calculated CO₂e emissions for these gases in determining annual emissions of CO₂e for their annual report. Because these reporters are already required to meet monitoring, recordkeeping, and reporting requirements for calculating the

quantity of the proposed F-GHGs in metric tons, additional costs to report CO₂e using the GWPs are expected to be insignificant.

Equation A-1 is also used to determine whether the rule applies to direct emitters and suppliers in certain source categories where the applicability of the GHG reporting rule is based on a threshold quantity of GHGs that is either generated, emitted, imported, or exported over a calendar year, expressed in CO₂e. For some direct emitters or suppliers in these source categories, calculating CO₂e using the proposed GWP values would result in higher emissions or supply that might newly exceed the reporting threshold. These facilities would then be required to begin reporting under Part 98 in 2014 (see Section III.A.2 of this preamble), with the associated monitoring, recordkeeping, and reporting costs.

If finalized, the proposed amendments to Table A-1 would result in a collective increase in annual reported emissions from all subparts of more than 104 million metric tons CO₂e (a 1.4 percent increase in current emissions), which the EPA has concluded more accurately reflects the estimated radiative forcing from the emissions reported under Part 98. The increase would include 4.8 million metric tons CO₂e from an estimated 184 additional facilities that would be newly required to report under Part 98 based on the new and revised GWPs. The number of

new reporters estimated, the estimated increase in emissions or supply from existing reporters (reporters who submitted 2010 and 2011 reports) and new reporters, and the estimated total change in source category emissions or supply for each subpart are summarized in Table 10 of this preamble.

Table 10. Summary of Estimated Impacts on Reported Emissions Due to Proposed Revisions to Table A-1 for Part 98 Subparts

Subpart	Number of Existing Reporters	Total Reported Emissions or Supply for Existing Reporters Prior to Proposed Amendments (non-biogenic) (metric tons CO ₂ e/year)	Number of Estimated New Reporters	Estimated Incremental Reported Emissions or Supply for New Reporters (metric tons CO ₂ e/year)	Estimated Change in Reported Source Category Emissions or Supply Due to Proposed Amendments (metric tons CO ₂ e/year)
2010 Reporters					
C	4,211	619,572,472	0	0	112,339
D	1,263	2,231,408,653	0	0	293,276
E	2	4,397,310	0	0	(170,218)
F	9	4,298,897	0	0	283,040
G	22	13,596,985	0	0	0
H	97	42,734,686	0	0	2,657
K	10	2,240,907	0	0	1,743
N	103	2,061,679	0	0	0
O	5	6,351,797	0	0	1,682,955
P	101	31,261,120	0	0	10
Q	123	27,094,226	0	0	(21)
R	12	588,209	0	0	0
S	70	15,566,816	0	0	174
U	19	122,663	0	0	0
V	36	11,990,739	0	0	(464,158)
X	63	9,445,122	0	0	11,973
Y	145	55,751,060	0	0	100,695
Z	13	1,080,913	0	0	0
AA	110	7,562,923	0	0	50,408
BB	1	122,466	0	0	2,141
CC	4	1,221,863	0	0	0
EE	7	1,447,634	0	0	0

Subpart	Number of Existing Reporters	Total Reported Emissions or Supply for Existing Reporters Prior to Proposed Amendments (non-biogenic) (metric tons CO ₂ e/year)	Number of Estimated New Reporters	Estimated Incremental Reported Emissions or Supply for New Reporters (metric tons CO ₂ e/year)	Estimated Change in Reported Source Category Emissions or Supply Due to Proposed Amendments (metric tons CO ₂ e/year)
GG	6	730,209	0	0	0
HH	1,202	107,000,000	57	1,560,000	2,787,153
MM	155	2,493,881,410	0	0	0
NN	476	909,000,000	0	0	0
OO	167	254,554,000	3	75,000	44,060,000
2011 Reporters					
I	94	5,622,570	4	18,076	1,052,905
L	14	10,600,000	0	0	1,060,000
T	11	1,067,000	0	0	(37,213)
W	2,786	337,000,000	99	2,572,881	41,136,821
DD	141	10,320,000	0	0	(474,979)
FF	114	33,823,404	0	0	6,442,553
II	244	5,845,000	2	59,500	1,172,833
JJ ^a	0	0	0	0	0
LL	0	0	0	0	0
PP	99	33,500,000	0	0	0
QQ	108	21,907,182	0	0	1,915,000
RR	10	7,162,885	0	0	0
SS	10	814,128	0	0	(37,470)
TT	200	13,700,000	19	520,000	3,129,524
UU	92	48,735,442	0	0	0
Total	12,355	7,385,182,369	184	4,805,457	104,114,139

^a There are no reporters for subpart JJ of Part 98 because the EPA will not be implementing subpart JJ due to a Congressional restriction prohibiting the expenditure of funds for this purpose.

Additional reporters would be expected to report under subparts I, W, HH, II, OO, and TT due to an increase in the number of facilities exceeding the CO₂e threshold. The majority of these additional reporters would be expected from subpart W, Petroleum and Natural Gas Systems, and subpart HH, Municipal Solid Waste Landfills. There are no expected additional

reporters from the other 36 subparts. We do not anticipate that the proposed revisions would reduce the number of reporters that meet CO₂e thresholds for any subpart. The change in reported emissions or supply from each subpart are summarized in Sections V.A.1 of this preamble. A detailed analysis of the impacts for each subpart, including the number of additional reporters expected, the quantities of annual GHGs reported, and the compliance costs for expected additional reporters, is included in the Impacts Analysis (see Docket ID No. EPA-HQ-OAR-2012-0934).

The total cost of compliance for the additional expected reporters is \$3.9 million for the first year and \$1.2 million per year for subsequent years. The annual costs for the additional reporters is an approximate increase of 1.2 percent above the current reporters cost of compliance with Part 98. The expected costs of the proposed amendments and the associated methodology are summarized in Section V.A.2 of this preamble.

1. How were the number of reporters and the change in annual emissions or supply estimated?

The EPA evaluated the number of reporters affected by the proposed amendments by examining the 2010 and 2011 reporters that are already affected under Part 98. For the number of affected facilities, the EPA examined available e-GGRT data from the 2010 reporting year and summary data that were developed to

support the current Part 98 to determine the number of existing affected facilities. We then evaluated the number of additional facilities that could be required to report under each subpart by determining what additional facilities could exceed Part 98 source category thresholds. Affected subparts that might have additional reporters due to the proposed new or revised GWPs are those that meet all of the following criteria: (1) The subpart has a reporting threshold that is based on CO₂e; (2) the subpart requires reporting of emissions or supply of F-GHG, CH₄, or N₂O, (other than combustion related emissions, which are a small percentage of total combustion emissions); and (3) the EPA estimates that there are some facilities in the source category that did not previously exceed the threshold. The EPA analyzed the applicability of these criteria to each subpart; the subparts that met these three criteria and could have new reporters as a result of the proposed changes to Table A-1 were subparts I, T, W, HH, II, OO, and TT.

In order to determine the number of additional reporters expected under these subparts, we used data from industry surveys and publicly available data sources to compile a list of facilities that could be affected in each subpart. Combined with source-specific data, we used these facility lists to estimate the change in facility emissions or supply using the proposed new and revised GWPs and to identify the additional facilities

in each subpart that could meet a CO₂e-based threshold.

Following this review, the EPA determined that there would likely be no new reporters from the magnesium production source category (subpart T).

The EPA determined the estimated increases in reported emissions for each subpart by examining the available data for 2010 and 2011 reporters. For existing facilities submitting an initial annual report for reporting year 2010, the increase in calculated emissions from each facility was estimated by adjusting the reported GHG mass emissions to CO₂e using the proposed AR4 GWP values. For existing facilities required to submit an initial annual report for reporting year 2011, we estimated CO₂e emissions and supply using data that was developed to support the original rule, such as the subpart-specific technical support documents. We also estimated the increase in emissions that would result from additional reporters in each subpart expected to exceed the source category threshold. For those facilities, the available source-specific emissions data for the expected new reporters was calculated in terms of CO₂e, and the estimated emissions were included in the total source category emissions.

Additional information on the EPA's analysis of the estimated number of reporters and the increase in reported CO₂e

for each subpart is in the Impacts Analysis (see Docket ID No. EPA-HQ-OAR-2012-0934).

2. How were the costs of this proposed rule estimated?

The compliance costs associated with the proposed amendments were determined for those additional reporters who would be required to submit an annual report under Part 98 if the proposed amendments to Table A-1 were finalized. The total compliance costs for additional reporters are estimated to be \$3.9 million for the first year and \$1.2 million for subsequent years (2011 dollars).

Costs for additional reporters are summarized in Table 11 of this preamble, which presents the first-year and subsequent-year costs for each source category.

Table 11. Cost Impacts of Proposed Amendments for Additional Reporters

Subpart	Number of Additional Reporters Due to Revised GWP	Incremental Cost Impact for Additional Reporters (\$/yr for first year)	Incremental Cost Impact for Additional Reporters (\$/yr for subsequent years)
I - Electronics Manufacturing	4	88,900	88,900
W - Petroleum & Natural Gas Systems	99	3,400,000	860,000
HH - Municipal Solid Waste Landfills	57	309,700	137,500
II - Industrial Wastewater	2	10,300	10,300
OO - Industrial GHG Suppliers	3	10,500	10,500

Subpart	Number of Additional Reporters Due to Revised GWP	Incremental Cost Impact for Additional Reporters (\$/yr for first year)	Incremental Cost Impact for Additional Reporters (\$/yr for subsequent years)
TT - Industrial Waste Landfills	19	118,600	87,300
Total	184	3,938,000	1,194,500

To estimate the cost impacts for additional reporters, the EPA used the methodologies from the subpart-specific regulatory impacts analyses from the original GHG reporting rule and updated the cost information to 2011 dollars. In general, we determined total reporting costs for each subpart by assigning model facility costs to individual affected facilities in each industry sector. Labor costs were determined for monitoring, recordkeeping, and reporting according to the rule requirements. Capital costs for monitoring equipment were also estimated for each model facility. The total cost for each subpart was determined by multiplying the model facility cost by the number of affected facilities.

For existing reporters that have submitted an annual report for reporting year 2010 or 2011, there would be no significant cost impacts resulting from the proposed amendments to Table A-1; using the proposed GWPs would not affect the cost of monitoring and recordkeeping and would not materially affect the cost for calculating emissions for these facilities. See the

Impacts Analysis (Docket ID No. EPA-HQ-OAR-2012-0934) for more details.

B. Additional Impacts of the Proposed Technical Corrections and Other Amendments

The proposed corrections also include clarifications to terms and definitions for certain emission equations, simplifications to calculation methods and data reporting requirements, or corrections for consistency between provisions within a subpart or between subparts in Part 98. In general, these clarifications and corrections do not fundamentally affect the applicability, monitoring requirements, or data collected and reported or increase the recordkeeping and reporting burden associated with Part 98. Although we have added a few new reporting provisions to select source categories, the data we are proposing to collect is expected to be readily available to reporters; in most cases, it would already have been recorded and would not require additional monitoring or monitoring equipment for existing reporters. Additionally, the proposed confidentiality determinations for new or revised data elements would not affect whether and how data are reported and therefore, would not impose any additional burden on sources. See the EPA's full analysis of the additional impacts of the corrections, clarifying, and other amendments in the Impacts Analysis in Docket ID No. EPA-HQ-OAR-2012-0934).

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review.

This action is not a "significant regulatory action" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011). This action (1) proposes to clarify or change specific provisions in the Greenhouse Gas Reporting Rule, including amending Table A-1 of Subpart A to incorporate new and revised GWPs, and (2) proposes confidentiality determinations for the reporting of new or substantially revised (i.e., requiring additional or different data to be reported) data elements contained in the proposed amendments. The EPA prepared an analysis of the potential compliance costs associated with the proposed amendments and amendments to revise global warming potentials in subpart A. This analysis is contained in the Impacts Analysis (see Docket ID No. EPA-HQ-OAR-2012-0934). A copy of the analysis is available in the docket for this action and the analysis is briefly summarized here. The total compliance costs for additional reporters are \$1,195,000 (\$2011). The highest costs are anticipated for 99 facilities affected by subpart W, Petroleum and Natural Gas Systems, (\$860,000), and 57 facilities

affected by subpart HH, Municipal Solid Waste Landfills (\$137,500). New facilities required to report under subparts I, II, OO, and TT would incur a combined cost of \$197,000. The proposed confidentiality determinations for new and substantially revised data elements do not increase the existing compliance costs. The compliance costs associated with the proposed amendments are less than the significance threshold of \$100 million per year. The compliance costs for individual facilities are not expected to impose a significant economic burden.

B. Paperwork Reduction Act

This action does not impose any new information collection burden. This action proposes amended GWP values in subpart A and other corrections and harmonizing revisions, and proposes confidentiality determinations for the reporting of new or substantially revised (i.e., requiring additional or different data to be reported) data elements contained in the proposed amendments. These proposed amendments and confidentiality determinations do not make any substantive changes to the reporting requirements in any of the subparts for which amendments are being proposed. The proposed amendments to subpart A include revision of GWPs in Table A-1 of subpart A. As discussed in Section V of this preamble, the proposed amendments could affect the total number of facilities reporting under Part

98 and increase the collective annual emissions or supply reported. The EPA prepared an analysis of the potential compliance costs associated with the proposed amendments to Table A-1 in the Impacts Analysis (see Docket ID No. EPA-HQ-OAR-2012-0934).

Other proposed amendments to subpart A include adding requirements that provide reporters instruction regarding reporting of location, ownership, and facility identification (i.e., reporting of ORIS codes). The remaining proposed changes also include revising and adding definitions. The proposed revisions are clarifications or require reporting of information that facilities are expected to have readily available (e.g., latitude and longitude of the facility, ORIS code for each power generating unit), and are not expected to result in significant burden for reporters.

The proposed amendments to the reporting requirements in the source category-specific subparts generally do not change the nature of the data reported and are not anticipated to result in significant burden for reporters. For example, several of the proposed amendments are clarifications or corrections to existing reporting requirements. For example, for subpart H, the EPA is proposing to require reporting of annual, facility-wide cement production instead of monthly, kiln-specific cement production for facilities that use a CEMS to measure CO₂

emissions. Because facilities are already expected to track facility-wide cement production for budgeting purposes, we do not expect this revision to result in any additional burden for cement production facilities. In some cases we are proposing to include reporting requirements for data that are already collected by reporters. For instance, for subpart RR, the EPA is proposing to add a reporting requirement for facilities to report the standard or method used to calculate the mass or volume of contents in containers that is redelivered to another facility without being injected into the well. The proposed data element does not require additional data collection or monitoring from reporters, and is not a significant change.

The EPA is also proposing changes that would reduce the reporting burden. For example, for subpart BB (Silicon Carbide Production), the EPA is proposing to remove the requirement for facilities to report CH₄ emissions from silicon carbide process units or furnaces. Additionally, the EPA is proposing to amend subpart BB such that facilities would calculate and report CO₂ emissions for all process units and furnaces combined, instead of each process unit or production furnace. We expect that both of these major changes will reduce the reporting burden for facilities subject to subpart BB.

Additional changes to the reporting requirements in each subpart are detailed in the Impacts Analysis (see Docket ID No.

EPA-HQ-OAR-2012-0934). The Office of Management and Budget (OMB) has previously approved the information collection requirements for 40 CFR part 98 under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq., and has assigned OMB control number 2060-0629, ICR 2300.10. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this proposed rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this proposed rule are small businesses. We have determined that up to 37 small municipal solid waste landfills, representing up to a .03% increase in regulated businesses in this industry, will experience an impact of .02 to .60% of revenues; up to 3 suppliers of industrial GHGs, representing up to a .02% increase in regulated businesses in this industry, will experience an impact of .02 to .14% of revenues; and that up to 19 industrial waste landfills (primarily co-located with food processing facilities), representing up to a .19% increase in regulated businesses in this industry, will experience an impact of .01 to .48% of revenues.

Although this proposed rule will not have a significant economic impact on a substantial number of small entities, the EPA nonetheless has tried to reduce the impact of this rule on small entities. For example, the EPA conducted several meetings with industry associations to discuss regulatory options and the corresponding burden on industry, such as recordkeeping and reporting. The EPA continues to conduct significant outreach on the mandatory GHG reporting rule and maintains an "open door"

policy for stakeholders to help inform the EPA's understanding of key issues for the industries.

We continue to be interested in the potential impacts of the proposed rule amendments on small entities and welcome comments on issues related to such impacts.

D. Unfunded Mandates Reform Act (UMRA)

The proposed rule amendments and confidentiality determinations do not contain a federal mandate that may result in expenditures of \$100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, the proposed rule amendments and confidentiality determinations are not subject to the requirements of section 202 and 205 of the UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The proposed rule amends specific provisions in subpart A, General Provisions, to reflect global warming potentials that have been published by the IPCC and to propose global warming potentials for certain fluorinated greenhouse gases. Also in this action, the EPA is revising specific provisions to provide clarity on what is to be reported. In some cases, the EPA has increased flexibility in the selection of methods used for calculating and monitoring GHGs. Therefore,

this action is not subject to the requirements of section 203 of the UMRA.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132.

These proposed amendments and confidentiality determinations apply directly to facilities that directly emit greenhouse gases or that are suppliers of greenhouse gases. They do not apply to governmental entities unless the government entity owns a facility that directly emits greenhouse gases above threshold levels (such as a landfill or large combustion device), so relatively few government facilities would be affected. Moreover, for government facilities that are subject to the rule, the proposed revisions will not have a significant cost impact. This regulation also does not limit the power of States or localities to collect GHG data and/or regulate GHG emissions. Thus, Executive Order 13132 does not apply to this action.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between the EPA and state

and local governments, we specifically solicit comment on this proposed action from state and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). The proposed amendments and confidentiality determinations apply directly to facilities that directly emit greenhouse gases or that are suppliers of greenhouse gases. They would not have tribal implications unless the tribal entity owns a facility that directly emits greenhouse gases above threshold levels (such as a landfill or large combustion device). Relatively few tribal facilities would be affected. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

The EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113 (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rulemaking does not involve the use of any new technical standards, but allows for greater flexibility for reporters to use consensus standards where they are available. Therefore, the EPA is not considering the use of specific voluntary consensus standards.

J. Executive Order 12898: Federal Actions to Address
Environmental Justice in Minority Populations and Low-Income
Populations

Executive Order 12898 (59 FR 7629, (February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment because it is a rule addressing information collection and reporting procedures.

List of Subjects 40 CFR Part 98

Environmental protection, Administrative practice and procedure, Greenhouse gases, Suppliers, Reporting and recordkeeping requirements.

Dated: March 8, 2013

Bob Perciasepe,
Acting Administrator.

For the reasons stated in the preamble, title 40, chapter I, of the Code of Federal Regulations is proposed to be amended as follows:

PART 98—[AMENDED]

1. The authority citation for part 98 continues to read as follows:

Authority: 42 U.S.C. 7401, et seq.

Subpart A—[AMENDED]

2. Section 98.3 is amended by:

- a. Revising paragraph (c)(1).
- b. Adding paragraphs (c)(11)(viii) and (c)(13).
- c. Revising paragraphs (h)(4), and (j)(3)(ii).
- d. Adding paragraphs (k) and (l).

§ 98.3 What are the general monitoring, reporting, recordkeeping and verification requirements of this part?

* * * * *

(c) * * *

(1) Facility name or supplier name (as appropriate), and physical street address of the facility or supplier, including the city, State, and zip code. If the facility does not have a physical street address, then the facility must provide the latitude and longitude representing the location of facility operations in decimal degree format. This must be provided in a comma-delimited "latitude, longitude" coordinate pair reported

in decimal degrees to at least four digits to the right of the decimal.

* * * *

(11) * *

(viii) The facility or supplier must refer to the reporting instructions of the electronic GHG reporting tool regarding standardized conventions for the naming of a parent company.

* * * *

(13) ORIS code for each power generation unit that has been assigned an ORIS code by the Energy Information Administration.

* * * *

(h) * *

(4) Notwithstanding paragraphs (h) (1) and (h) (2) of this section, upon request by the owner or operator, the Administrator may provide reasonable extensions of the 45-day period for submission of the revised report or information under paragraphs (h) (1) and (h) (2) of this section. If the Administrator receives a request for extension of the 45-day period, by e-mail to an address prescribed by the Administrator prior to the expiration of the 45-day period, the extension request is deemed to be automatically granted for 30 days. The Administrator may grant an additional extension beyond the automatic 30-day extension if the owner or operator submits a request for an additional extension and the request is received

by the Administrator at least 5 business days prior to the expiration of the automatic 30-day extension, provided the request demonstrates that it is not practicable to submit a revised report or information under paragraphs (h)(1) and (h)(2) within 75 days. The Administrator will approve the extension request if the request demonstrates that it is not practicable to collect and process the data needed to resolve potential reporting errors identified pursuant to paragraphs (h)(1) or (h)(2) of this section within 75 days.

* * * * *

(j) * * *

(3) * * *

(ii) Any subsequent extensions to the original request must be submitted to the Administrator within 4 weeks of the owner or operator identifying the need to extend the request, but in any event no later than 4 weeks before the date for the planned process equipment or unit shutdown that was provided in the original or most recently approved request.

* * * * *

(k) Revised Global Warming Potentials -- (1) General.

Starting with reporting year 2013, facilities and suppliers must use the revised GWPs in Table A-1 of this subpart, Global Warming Potentials, for calculating CO₂e emissions for

determining applicability to this part and for calculating CO₂e emissions in annual GHG reports.

(2) Special provision for reporting year 2013. A facility or supplier that was not subject to a subpart of part 98 for reporting year 2012, but becomes subject to a subpart of this part due to a change in the GWP for one or more compounds in Table A-1 of this subpart, Global Warming Potentials, is not required to submit an annual GHG for reporting year 2013. Such facilities or suppliers must start monitoring and collecting GHG data in compliance with this part starting on January 1, 2014, and submit an annual greenhouse gas report for reporting year 2014 by March 31, 2015.

(1) Special provision for best available monitoring methods in 2014. This paragraph (1) applies to owners or operators of facilities or suppliers that first become subject to any subpart of part 98 due to an amendment to Table A-1 of this subpart, Global Warming Potentials.

(1) Best available monitoring methods. From January 1, 2014 to March 31, 2014, owners or operators subject to this paragraph (1) may use best available monitoring methods for any parameter (e.g., fuel use, feedstock rates) that cannot reasonably be measured according to the monitoring and QA/QC requirements of a relevant subpart. The owner or operator must use the calculation methodologies and equations in the "Calculating GHG Emissions"

sections of each relevant subpart, but may use the best available monitoring method for any parameter for which it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by January 1, 2014. Starting no later than April 1, 2014, the owner or operator must discontinue using best available methods and begin following all applicable monitoring and QA/QC requirements of this part, except as provided in paragraph (1)(2) of this section. Best available monitoring methods means any of the following methods:

- (i) Monitoring methods currently used by the facility that do not meet the specifications of a relevant subpart.

- (ii) Supplier data.

- (iii) Engineering calculations.

- (iv) Other company records.

- (2) Requests for extension of the use of best available monitoring methods. The owner or operator may submit a request to the Administrator to use one or more best available monitoring methods beyond March 31, 2014.

- (i) Timing of request. The extension request must be submitted to EPA no later than January 31, 2014.

- (ii) Content of request. Requests must contain the following information:

(A) A list of specific items of monitoring instrumentation for which the request is being made and the locations where each piece of monitoring instrumentation will be installed.

(B) Identification of the specific rule requirements (by rule subpart, section, and paragraph numbers) for which the instrumentation is needed.

(C) A description of the reasons that the needed equipment could not be obtained and installed before April 1, 2014.

(D) If the reason for the extension is that the equipment cannot be purchased and delivered by April 1, 2014, supporting documentation such as the date the monitoring equipment was ordered, investigation of alternative suppliers and the dates by which alternative vendors promised delivery, backorder notices or unexpected delays, descriptions of actions taken to expedite delivery, and the current expected date of delivery.

(E) If the reason for the extension is that the equipment cannot be installed without a process unit shutdown, include supporting documentation demonstrating that it is not practicable to isolate the equipment and install the monitoring instrument without a full process unit shutdown. Include the date of the most recent process unit shutdown, the frequency of shutdowns for this process unit, and the date of the next planned shutdown during which the monitoring equipment can be installed. If there has been a shutdown or if there is a planned

process unit shutdown between [THE DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] and April 1, 2014, include a justification of why the equipment could not be obtained and installed during that shutdown.

(F) A description of the specific actions the facility will take to obtain and install the equipment as soon as reasonably feasible and the expected date by which the equipment will be installed and operating.

(iii) Approval criteria. To obtain approval, the owner or operator must demonstrate to the Administrator's satisfaction that it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by April 1, 2014. The use of best available methods under this paragraph (1) will not be approved beyond December 31, 2014.

3. Section 98.6 is amended by:

a. Revising the definitions for "Continuous bleed", "Degasification system", and "Intermittent bleed pneumatic devices".

b. Adding the definitions of "Fluidized Bed Combustor (FBC)" and "ORIS code" in alphabetical order.

c. Revising the term "Ventilation well or shaft" to read "Ventilation hole or shaft" and revising the definition of the term.

d. Revising the definition of "Ventilation system".

§ 98.6 Definitions.

* * * * *

Continuous bleed means a continuous flow of pneumatic supply natural gas to the process control device (e.g. level control, temperature control, pressure control) where the supply gas pressure is modulated by the process condition, and then flows to the valve controller where the signal is compared with the process set-point to adjust gas pressure in the valve actuator.

* * * * *

Degasification system means the entirety of the equipment that is used to drain gas from underground coal mines. This includes all degasification wells and gob gas vent holes at the underground coal mine. Degasification systems include gob and premine surface drainage wells, gob and premine in-mine drainage wells, and in-mine gob and premine cross-measure borehole wells.

* * * * *

Fluidized Bed Combustor (FBC) means a combustion technology (e.g., a fluidized bed boiler) where the maximum steady-state temperature reached within the combustor (excluding periods of startup, shutdown, and malfunction) during the combustion of solid fuels (e.g., coal, tire derived fuel, wood and wood residuals, agricultural byproducts, coke, municipal solid waste,

or mixtures of such fuels) is less than or equal to 1,900 degrees Fahrenheit.

* * * * *

Intermittent bleed pneumatic devices mean automated flow control devices powered by pressurized natural gas and used for automatically maintaining a process condition such as liquid level, pressure, delta-pressure and temperature. These are snap-acting or throttling devices that discharge all or a portion of the full volume of the actuator intermittently when control action is necessary, but does not bleed continuously.

* * * * *

ORIS code means the unique identifier assigned to each power plant in the National Electric Energy Data System (NEEDS). The ORIS code is a four-digit number assigned by the Energy Information Administration (EIA) at the US Department of Energy to power plants owned by utilities.

* * * * *

Ventilation hole or shaft means a vent hole or shaft employed at an underground coal mine to serve as the outlet or conduit to move air from the ventilation system out of the mine.

Ventilation system means a system that is used to control the concentration of methane and other gases within mine working areas through mine ventilation, rather than a mine degasification system. A ventilation system consists of fans

that move air through the mine workings to dilute methane concentrations.

* * * * *

4a. Table A-1 to Subpart A is revised to read as follows:

**Table A-1 to Subpart A of Part 98—Global Warming Potentials
[100-Year Time Horizon]**

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Carbon dioxide	124-38-9	CO ₂	1
Methane	74-82-8	CH ₄	25 ^a
Nitrous oxide	10024-97-2	N ₂ O	298 ^a
HFC-23	75-46-7	CHF ₃	14,800 ^a
HFC-32	75-10-5	CH ₂ F ₂	675 ^a
HFC-41	593-53-3	CH ₃ F	92 ^a
HFC-125	354-33-6	C ₂ HF ₅	3,500 ^a
HFC-134	359-35-3	C ₂ H ₂ F ₄	1,100 ^a
HFC-134a	811-97-2	CH ₂ FCF ₃	1,430 ^a
HFC-143	430-66-0	C ₂ H ₃ F ₃	353 ^a
HFC-143a	420-46-2	C ₂ H ₃ F ₃	4,470 ^a
HFC-152	624-72-6	CH ₂ FCH ₂ F	53
HFC-152a	75-37-6	CH ₃ CHF ₂	124 ^a
HFC-161	353-36-6	CH ₃ CH ₂ F	12
HFC-227ea	431-89-0	C ₃ HF ₇	3,220 ^a
HFC-236cb	677-56-5	CH ₂ FCF ₂ CF ₃	1,340
HFC-236ea	431-63-0	CHF ₂ CHFCF ₃	1,370
HFC-236fa	690-39-1	C ₃ H ₂ F ₆	9,810 ^a
HFC-245ca	679-86-7	C ₃ H ₃ F ₅	693 ^a
HFC-245fa	460-73-1	CHF ₂ CH ₂ CF ₃	1,030

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HFC-365mfc	406-58-6	$\text{CH}_3\text{CF}_2\text{CH}_2\text{CF}_3$	794
HFC-43-10mee	138495-42-8	$\text{CF}_3\text{CFHCFHCF}_2\text{CF}_3$	1,640 ^a
Sulfur hexafluoride	2551-62-4	SF_6	22,800 ^a
Trifluoromethyl sulphur pentafluoride	373-80-8	SF_5CF_3	17,700
Nitrogen trifluoride	7783-54-2	NF_3	17,200
PFC-14 (Perfluoromethane)	75-73-0	CF_4	7,390 ^a
PFC-116 (Perfluoroethane)	76-16-4	C_2F_6	12,200 ^a
PFC-218 (Perfluoropropane)	76-19-7	C_3F_8	8,830 ^a
Perfluorocyclopropane	931-91-9	$\text{C}-\text{C}_3\text{F}_6$	17,340
PFC-3-1-10 (Perfluorobutane)	355-25-9	C_4F_{10}	8,860 ^a
Perfluorocyclobutane	115-25-3	$\text{C}-\text{C}_4\text{F}_8$	10,300 ^a
PFC-4-1-12 (Perfluoropentane)	678-26-2	C_5F_{12}	9,160 ^a
PFC-5-1-14 (Perfluorohexane)	355-42-0	C_6F_{14}	9,300 ^a
PFC-9-1-18	306-94-5	$\text{C}_{10}\text{F}_{18}$	7,500
HCFE-235da2 (Isoflurane)	26675-46-7	$\text{CHF}_2\text{OCHClCF}_3$	350
HFE-43-10pccc (H-Galden 1040x)	E1730133	$\text{CHF}_2\text{OCF}_2\text{OC}_2\text{F}_4\text{OCHF}_2$	1,870
HFE-125	3822-68-2	CHF_2OCF_3	14,900
HFE-134	1691-17-4	$\text{CHF}_2\text{OCHF}_2$	6,320
HFE-143a	421-14-7	CH_3OCF_3	756
HFE-227ea	2356-62-9	$\text{CF}_3\text{CHFOCF}_3$	1,540
HFE-236ca12 (HG-10)	78522-47-1	$\text{CHF}_2\text{OCF}_2\text{OCHF}_2$	2,800
HFE-236ea2 (Desflurane)	57041-67-5	$\text{CHF}_2\text{OCHFCF}_3$	989

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HFE-236fa	20193-67-3	$\text{CF}_3\text{CH}_2\text{OCF}_3$	487
HFE-245cb2	22410-44-2	$\text{CH}_3\text{OCF}_2\text{CF}_3$	708
HFE-245fa1	84011-15-4	$\text{CHF}_2\text{CH}_2\text{OCF}_3$	286
HFE-245fa2	1885-48-9	$\text{CHF}_2\text{OCH}_2\text{CF}_3$	659
HFE-254cb2	425-88-7	$\text{CH}_3\text{OCF}_2\text{CHF}_2$	359
HFE-263fb2	460-43-5	$\text{CF}_3\text{CH}_2\text{OCH}_3$	11
HFE-329mcc2	67490-36-2	$\text{CF}_3\text{CF}_2\text{OCF}_2\text{CHF}_2$	919
HFE-338mcf2	156053-88-2	$\text{CF}_3\text{CF}_2\text{OCH}_2\text{CF}_3$	552
HFE-338pcc13 (HG-01)	188690-78-0	$\text{CHF}_2\text{OCF}_2\text{CF}_2\text{OCHF}_2$	1,500
HFE-347mcc3	28523-86-6	$\text{CH}_3\text{OCF}_2\text{CF}_2\text{CF}_3$	575
HFE-347mcf2	E1730135	$\text{CF}_3\text{CF}_2\text{OCH}_2\text{CHF}_2$	374
HFE-347pcf2	406-78-0	$\text{CHF}_2\text{CF}_2\text{OCH}_2\text{CF}_3$	580
HFE-356mec3	382-34-3	$\text{CH}_3\text{OCF}_2\text{CHFCF}_3$	101
HFE-356pcc3	160620-20-2	$\text{CH}_3\text{OCF}_2\text{CF}_2\text{CHF}_2$	110
HFE-356pcf2	E1730137	$\text{CHF}_2\text{CH}_2\text{OCF}_2\text{CHF}_2$	265
HFE-356pcf3	35042-99-0	$\text{CHF}_2\text{OCH}_2\text{CF}_2\text{CHF}_2$	502
HFE-365mcf3	378-16-5	$\text{CF}_3\text{CF}_2\text{CH}_2\text{OCH}_3$	11
HFE-374pc2	512-51-6	$\text{CH}_3\text{CH}_2\text{OCF}_2\text{CHF}_2$	557
HFE-449s1 (HFE-7100) Chemical blend	163702-07-6 163702-08-7	$\text{C}_4\text{F}_9\text{OCH}_3$ $(\text{CF}_3)_2\text{CFCH}_2\text{OCH}_3$	297
HFE-569sf2 (HFE-7200) Chemical blend	163702-05-4 163702-06-5	$\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$ $(\text{CF}_3)_2\text{CFCH}_2\text{OC}_2\text{H}_5$	59
Sevoflurane	28523-86-6	$\text{CH}_2\text{FOCH}(\text{CF}_3)_2$	345
HFE-356mm1	13171-18-1	$(\text{CF}_3)_2\text{CHOCH}_3$	27
HFE-338mmz1	26103-08-2	$\text{CHF}_2\text{OCH}(\text{CF}_3)_2$	380
(Octafluorotetramethylene)hydroxymethyl group	NAX-	$(\text{CF}_2)_4\text{CH}(\text{OH})-\text{X}$	73
HFE-347mmy1	22052-84-2	$\text{CH}_3\text{OCF}(\text{CF}_3)_2$	343

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Bis(trifluoromethyl)-methanol	920-66-1	$(\text{CF}_3)_2\text{CHOH}$	195
2,2,3,3,3-pentafluoropropanol	422-05-9	$\text{CF}_3\text{CF}_2\text{CH}_2\text{OH}$	42
PFFPMIE	NA	$\text{CF}_3\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCF}_2\text{OCF}_3$	10,300
HFC-1234ze ^b	29118-24-9	$\text{C}_3\text{H}_2\text{F}_4$	6
hexafluoropropylene (HFP) ^b	116-15-4	C_3F_6	0.25
perfluoromethyl vinyl ether (PMVE) ^b	1187-93-5	$\text{CF}(\text{CF}_3)\text{OCF}_3$	3
tetrafluoroethylene (TFE) ^b	116-14-3	C_2F_4	0.02
trifluoro propene (TFP) ^b	677-21-4	$\text{C}_3\text{H}_3\text{F}_3$	3
vinyl fluoride (VF) ^b	75-02-5	$\text{C}_2\text{H}_3\text{F}$	0.7
vinylidene fluoride (VF2) ^b	75-38-7	$\text{C}_2\text{H}_2\text{F}_2$	0.9
carbonyl fluoride ^b	353-50-4	COF_2	2
perfluoropropyl vinyl ether ^b	1623-05-8	$\text{C}_5\text{F}_{10}\text{O}$	3
perfluoroethyl vinyl ether ^b	10493-43-3	$\text{C}_4\text{F}_8\text{O}$	3
HFC-1234yf ^b	754-12-1	$\text{C}_3\text{H}_2\text{F}_4$	4
perfluorethyl iodide (2-I) ^b	354-64-3	$\text{C}_2\text{F}_5\text{I}$	3
perfluorobutyl iodide (PFBI, 42-I) ^b	423-39-2	$\text{C}_4\text{F}_9\text{I}$	3
perfluorohexyl iodide (6-I) ^b	355-43-1	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{IC}_6\text{F}_{13}\text{I}$	2
perfluorooctyl iodide (8-I) ^b	507-63-1	$\text{C}_8\text{F}_{17}\text{I}$	2
1,1,1,2,2-pentafluoro-4-iodo butane (22-I) ^b	40723-80-6	$\text{C}_4\text{H}_4\text{F}_5\text{I}$	2
1,1,1,2,2,3,3,4,4-nonafluoro-6-iodo hexane (42-I) ^b	2043-55-2	$\text{C}_6\text{H}_4\text{F}_9\text{I}$	2
perfluorobutyl ethene (42-U) ^b	19430-93-4	$\text{C}_6\text{H}_3\text{F}_9$	2
perfluorohexyl ethene (62-	25291-17-2	$\text{C}_8\text{H}_3\text{F}_{13}$	1

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
U) ^b			
perfluorooctyl ethene (82-U) ^b	21652-58-4	C ₁₀ H ₃ F ₁₇	1
1H,1H, 2H,2H-perfluorohexan-1-ol (42-AL) ^b	2043-47-2	C ₆ H ₅ F ₉ O	5
FK-5-1-12 Perfluoroketone; FK-5-1-12myy2; n-Perfluorooctane; Octadecafluorooctane ^b	756-13-8	CF ₃ CF ₂ C(O)CF(CF ₃) ₂	1.8
C7 Fluoroketone, Novec 774/FK-6-1-12	813-44-5 and 813-45-6	C ₇ F ₁₄ O Chemical Blend	1
trans-1-chloro-3,3,3-trifluoroprop-1-ene ^b	2730-43-0	C ₃ H ₂ ClF ₃	7
Hexadecofluoroheptane ^b (PFC-6-1-12)	335-57-9	C ₇ F ₁₆	7930
octadecafluorooctane ^b (PFC-7-1-18)	307-34-6	C ₈ F ₁₈	8340

^a The GWP for this compound is different than the GWP in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.

^b The GWP for this compound was not provided in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.
NA - Not available

4b. Table A-6 is amended by revising the entries for 98.346(d)(1) and 98.346(e) to read as follows:

Table A-6 to Subpart A of Part 98—Data Elements That Are Inputs to Emission Equations and for Which the Reporting Deadline Is March 31, 2013

Subpart	Rule citation (40 CFR part 98)	Specific data elements for which reporting date is March 31, 2013 ("All" means all data elements in the cited paragraph are not required to be reported until March 31, 2013)
* * *	* * *	* * *
HH	98.346(d)(1)	Only degradable organic carbon (DOC) value, and fraction of DOC dissimilated (DOCF) values.
* * *	* * *	* * *
HH	98.346(e)	Only fraction of CH ₄ in landfill gas and methane correction factor (MCF) values.
* * *	* * *	* * *

Subpart C—[AMENDED]

5. Section 98.33 is amended by:

- a. Adding paragraphs (b)(1)(viii) and (ix).
- b. Revising paragraphs (b)(3)(ii)(A), (e)(1)(ii), and (e)(3)(iv)(B).

§ 98.33 Calculating GHG emissions.

* * *

(b) * * *

(1) * * *

(viii) May be used for the combustion of a fuel listed in Table C-1 if the fuel is combusted in a unit with a maximum rated heat input capacity greater than 250 mmBtu/hr (or, pursuant to §98.36(c)(3), in a group of units served by a common

supply pipe, having at least one unit with a maximum rated heat input capacity greater than 250 mmBtu/hr), provided that both of the following conditions apply:

(A) The use of Tier 4 is not required.

(B) The fuel provides less than 10 percent of the annual heat input to the unit, or if §98.36(c)(3) applies, to the group of units served by a common supply pipe.

(ix) May not be used for the combustion of waste coal (i.e., waste anthracite (culm) and waste bituminous (gob)).

* * * * *

(3) * * *

(ii) * * *

(A) The use of Tier 1 or 2 is permitted, as described in paragraphs (b)(1)(iii), (b)(1)(v), (b)(1)(viii), and (b)(2)(ii) of this section.

* * * * *

(e) * * *

(1) * * *

(ii) The procedures in paragraph (e)(4) of this section.

* * * * *

(3) * * *

(iv) * * *

(B) Multiply the result from paragraph (e)(3)(iv)(A) of this section by the appropriate default factor to determine the

annual biogenic CO₂ emissions, in metric tons. For MSW, use a default factor of 0.55 and for tires, use a default factor of 0.20.

* * * * *

6. Section 98.36 is amended by revising paragraph (b) (3) and the next to last sentence of paragraph (c) (3) introductory text to read as follows:

§ 98.36 Data reporting requirements.

* * * * *

(b) * * *

(3) Maximum rated heat input capacity of the unit, in mmBtu/hr.

* * * * *

(c) * * *

(3) * * * As a second example, in accordance with §98.33(b) (1) (v), Tier 1 may be used regardless of unit size when natural gas is transported through the common pipe, if the annual fuel consumption is obtained from gas billing records in units of therms or mmBtu.* * *

* * * * *

7. Tables C-1 and C-2 to Subpart C are revised to read as follows:

Table C-1 to Subpart C—Default CO₂ Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO₂ emission factor
Coal and coke	mmBtu/short ton	kg CO ₂ /mmBtu
Anthracite	25.09	103.69
Waste Anthracite (Culm)	See footnote 1	103.69
Bituminous	24.93	93.28
Waste Bituminous (Gob)	See footnote 1	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO ₂ /mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO ₂ /mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG) ²	0.092	61.71
Propane ²	0.091	62.87
Propylene ²	0.091	67.77

Fuel type	Default high heat value	Default CO₂ emission factor
Ethane ²	0.068	59.60
Ethanol	0.084	68.44
Ethylene ³	0.058	65.96
Isobutane ²	0.099	64.94
Isobutylene ²	0.103	68.86
Butane ²	0.103	64.77
Butylene ²	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels-solid	mmBtu/short ton	kg CO ₂ /mmBtu
Municipal Solid Waste	9.95 ⁴	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels-gaseous	mmBtu/scf	kg CO ₂ /mmBtu

Fuel type	Default high heat value	Default CO₂ emission factor
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas ⁵	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO ₂ /mmBtu
Wood and Wood Residuals(dry basis) ⁶	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO ₂ /mmBtu
Landfill Gas	0.485×10^{-3}	52.07
Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO ₂ /mmBtu
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

¹Provisions of the rule referencing “default HHVs from Table C-1” do not apply to culm and gob. The HHV for culm and gob must be determined according to the procedures specified in the Tier 2 Calculation Methodology.

²The HHV for components of LPG determined at 60°F and saturation pressure with the exception of ethylene.

³Ethylene HHV determined at 41°F (5°C) and saturation pressure.

⁴Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

⁵Reporters subject to subpart X of this part that are complying with §98.243(d) or subpart Y of this part may only use the default HHV and the

default CO₂ emission factor for fuel gas combustion under the conditions prescribed in §98.243(d)(2)(i) and (d)(2)(ii) and §98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

⁶Use the following formula to calculate a wet basis HHV for use in Equation C-1: $HHV_w = ((100-M)/100) * HHV_d$ where HHV_w = wet basis HHV, M = moisture content (percent) and HHV_d = dry basis HHV from Table C-1.

Table C-2 to Subpart C-Default CH₄ and N₂O Emission Factors for Various Types of Fuel

Fuel type	Default CH ₄ emission factor (kg CH ₄ /mmBtu)	Default N ₂ O emission factor (kg N ₂ O/mmBtu)
Coal and Coke (All fuel types in Table C-1) ¹	1.1×10^{-02}	1.6×10^{-03}
Anthracite for FBCs only ²	1.1×10^{-02}	1.6×10^{-01}
Waste Anthracite (Culm) for FBCs only ²	1.1×10^{-02}	4.0×10^{-01}
Bituminous for FBCs only ²	1.1×10^{-02}	1.3×10^{-01}
Waste Bituminous (Gob) for FBCs only ²	1.1×10^{-02}	2.9×10^{-01}
Subbituminous for FBCs only ²	1.1×10^{-02}	6.5×10^{-02}
Lignite for FBCs only ²	1.1×10^{-02}	1.1×10^{-01}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C-1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels-Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-3}	3.6×10^{-3}
Biomass Fuels-Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}

Fuel type	Default CH ₄ emission factor (kg CH ₄ /mmBtu)	Default N ₂ O emission factor (kg N ₂ O/mmBtu)
Biomass Fuels—Liquid (All fuel types in Table C-1)	1.1×10^{-03}	1.1×10^{-04}

¹Use of the default emission factors for the coal and coke category may not be used to estimate emissions from combusting anthracite, waste anthracite, bituminous, waste bituminous, subbituminous, or lignite coal burned in an FBC.

²Use of these default emission factors is required for FBCs burning the specified coal type.

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH₄/mmBtu.

* * * * *

Subpart E—[AMENDED]

8. Section 98.53 is amended by:

- a. Revising paragraph (b) (3) and paragraph (d) introductory text.
- b. Revising paragraph (e) and Equation E-2.
- c. Revising the parameters "DF" and "AF" of Equation E-3a.
- d. Revising the parameters "DF₁", "AF₁", "DF₂", "AF₂", "DF_N", and "AF_N" of Equation E-3b.
- e. Revising the parameters "DF_N", "AF_N", and "FC_N" of Equation E-3c.

§ 98.53 Calculating GHG emissions.

* * * * *

(b) * * *

(3) You must measure the adipic acid production rate during the test and calculate the production rate for the test period in tons per hour.

* * * * *

(d) If the adipic acid production unit exhausts to any N₂O abatement technology "N", you must determine the destruction efficiency according to paragraphs (d)(1), (d)(2), or (d)(3) of this section.

* * * * *

(e) If the adipic acid production unit exhausts to any N₂O abatement technology "N", you must determine the annual amount of adipic acid produced while N₂O abatement technology "N" is operating according to §98.54(f). Then you must calculate the abatement factor for N₂O abatement technology "N" according to Equation E-2 of this section.

$$AF_N = \frac{P_{z,N}}{P_z} \quad (\text{Eq. E-2})$$

* * * * *

(g) * * *

(1) * * *

* * * * *

DF = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF = Abatement utilization factor of N₂O abatement technology "N" (decimal fraction of time that the abatement technology is operating).

* * * * *

(2) * * *

* * * * *

DF₁ = Destruction efficiency of N₂O abatement technology 1 (decimal fraction of N₂O removed from vent stream).

AF₁ = Abatement utilization factor of N₂O abatement technology 1 (decimal fraction of time that abatement technology 1 is operating).

DF₂ = Destruction efficiency of N₂O abatement technology 2 (decimal fraction of N₂O removed from vent stream).

AF₂ = Abatement utilization factor of N₂O abatement technology 2 (decimal fraction of time that abatement technology 2 is operating).

DF_N = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology "N" (decimal fraction of time that abatement technology N is operating).

* * * * *

(3) * * *

* * * * *

DF_N = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology "N" (decimal fraction of time that the abatement technology is operating).

FC_N = Fraction control factor of N₂O abatement technology "N" (decimal fraction of total

emissions from unit "z" that are sent to
abatement technology "N").

* * * * *

9. Section 98.54 is amended by revising paragraphs (e) and
(f) to read as follows:

§ 98.54 Monitoring and QA/QC requirements.

* * * * *

(e) You must determine the monthly amount of adipic acid
produced. You must also determine the monthly amount of adipic
acid produced during which N₂O abatement technology is operating.
These monthly amounts are determined according to the methods in
paragraphs (c)(1) or (c)(2) of this section.

(f) You must determine the annual amount of adipic acid
produced. You must also determine the annual amount of adipic
acid produced during which N₂O abatement technology is operating.
These are determined by summing the respective monthly adipic
acid production quantities determined in paragraph (e) of this
section.

Subpart G—[AMENDED]

10. Section 98.73 is amended by:

a. Revising paragraph (b)(4) introductory text and
revising Equation G-4.

b. Revising Equation G-5 and by removing parameter "n" of
Equation G-5 and adding in its place parameter "j".

§ 98.73 Calculating GHG emissions.

* * * *

(b) * *

(4) You must calculate the annual process CO₂ emissions from each ammonia processing unit k at your facility according to Equation G-4 of this section:

$$E_{CO_2,k} = CO_{2,G,k} + CO_{2,L,k} + CO_{2,S,k} \quad (\text{Eq. G-4})$$

* * * *

(5) * *

$$CO_2 = \sum_{k=1}^j E_{CO_2,k} \quad (\text{Eq. G-5})$$

* * * *

j = Total number of ammonia processing units.

* * * *

11. Section 98.75 is amended by revising paragraph (b) to read as follows:

§ 98.75 Procedures for estimating missing data.

* * * *

(b) For missing feedstock supply rates used to determine monthly feedstock consumption or monthly waste recycle stream quantity, you must determine the best available estimate(s) of the parameter(s), based on all available process data.

12. Section 98.76 is amended by revising paragraphs (a) introductory text, (b) introductory text, and (b) (13) to read as follows:

§ 98.76 Data reporting requirements.

* * * * *

(a) If a CEMS is used to measure CO₂ emissions, then you must report the relevant information required under §98.36 for the Tier 4 Calculation Methodology and the information in paragraphs (a)(1) and (a)(2) of this section:

* * * * *

(b) If a CEMS is not used to measure emissions, then you must report all of the following information in this paragraph (b):

* * * * *

(13) Annual CO₂ emissions (metric tons) from the steam reforming of a hydrocarbon or the gasification of solid and liquid raw material at the ammonia manufacturing process unit used to produce urea and the method used to determine the CO₂ consumed in urea production.

Subpart H—[AMENDED]

13. Section 98.86 is amended by revising paragraph (a)(2) to read as follows:

§ 98.86 Data reporting requirements.

* * * * *

(a) * * *

(2) Annual facility cement production.

* * * * *

Subpart K—[AMENDED]

14. Section 98.113 is amended by revising Equation K-3 and by removing the parameter "2000/2205" of Equation K-3 and adding in its place the parameter "2/2205" to read as follows:

§ 98.113 Calculating GHG emissions.

* * * * *

(d) * * *

(1) * * *

$$E_{CH_4} = \sum_1^i (M_{product_i} \times \frac{2}{2205} \times EF_{product_i}) \quad (Eq. K-3)$$

* * * * *

2/2205 = Conversion factor to convert kg CH₄/ton of product to metric tons CH₄.

* * * * *

15. Section 98.116 is amended by adding paragraph (e) (2) to read as follows:

§ 98.116 Data reporting requirements.

* * * * *

(e) * * *

(2) Annual process CH₄ emissions (in metric tons) from each EAF used for the production of any ferroalloy listed in Table K-1 of this subpart.

* * * * *

Subpart L—[AMENDED]

16. Section 98.126 is amended by revising paragraphs (j) introductory text, (j)(1), and (j)(3)(i) to read as follows:

§ 98.126 Data reporting requirements.

* * * * *

(j) Special provisions for reporting years 2011, 2012, and 2013 only. For reporting years 2011, 2012, and 2013, the owner or operator of a facility must comply with paragraphs (j)(1), (j)(2), and (j)(3) of this section.

(1) Timing. The owner or operator of a facility is not required to report the data elements at §98.3(c)(4)(iii) and paragraphs (a)(2), (a)(3), (a)(4), (a)(6), (b), (c), (d), (e), (f), (g), and (h) of this section until the later of March 31, 2015 or the date set forth for that data element at §98.3(c)(4)(vii) and Table A-7 of Subpart A of this part.

* * * * *

(3) * * *

(i) If you choose to use a default GWP rather than your best estimate of the GWP for fluorinated GHGs whose GWPs are not listed in Table A-1 of Subpart A of this part, use a default GWP of 10,000 for fluorinated GHGs that are fully fluorinated GHGs and use a default GWP of 2000 for other fluorinated GHGs.

* * * * *

Subpart N—[AMENDED]

17. Section 98.143 is amended by:

- a. Revising the introductory text.
- b. Revising paragraph (b) introductory text.
- c. Revising the parameters " MF_i " and " F_i " of Equation N-1.

§ 98.143 Calculating GHG emissions.

You must calculate and report the annual process CO₂ emissions from each continuous glass melting furnace using the procedure in paragraphs (a) through (c) of this section.

* * * * *

(b) For each continuous glass melting furnace that is not subject to the requirements in paragraph (a) of this section, calculate and report the process and combustion CO₂ emissions from the glass melting furnace by using either the procedure in paragraph (b)(1) of this section or the procedure in paragraph (b)(2) of this section, except as specified in paragraph (c) of this section.

* * * * *

(2) * * *

(iv) * * *

* * * * *

MF_i = Annual average decimal mass fraction of carbonate-based mineral i in carbonate-based raw material i.

* * * * *

F_i = Decimal fraction of calcination achieved for carbonate-based raw material i , assumed to be equal to 1.0.

* * * * *

18. Section 98.144 is amended by revising paragraph (b) to read as follows:

§ 98.144 Monitoring and QA/QC requirements.

* * * * *

(b) You must measure carbonate-based mineral mass fractions at least annually to verify the mass fraction data provided by the supplier of the raw material; such measurements shall be based on sampling and chemical analysis using consensus standards that specify X-ray fluorescence. For measurements made in years prior to the emissions reporting year 2014, you may also use ASTM D3682-01 (Reapproved 2006) Standard Test Method for Major and Minor Elements in Combustion Residues from Coal Utilization Processes (incorporated by reference, see §98.7) or ASTM D6349-09 Standard Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of Coal and Coke by Inductively Coupled Plasma-Atomic Emission Spectrometry (incorporated by reference, see §98.7).

* * * * *

19. Section 98.146 is amended by revising paragraphs

(b)(4), (b)(6), and (b)(7) to read as follows:

§ 98.146 Data reporting requirements.

* * * * *

(b) * * *

(4) Carbonate-based mineral decimal mass fraction for each carbonate-based raw material charged to a continuous glass melting furnace.

* * * * *

(6) The decimal fraction of calcination achieved for each carbonate-based raw material, if a value other than 1.0 is used to calculate process mass emissions of CO₂.

(7) Method used to determine decimal fraction of calcination.

* * * * *

20. Section 98.147 is amended by revising paragraph (b) (5) to read as follows:

§ 98.147 Records that must be retained.

* * * * *

(b) * * *

(5) The decimal fraction of calcination achieved for each carbonate-based raw material, if a value other than 1.0 is used to calculate process mass emissions of CO₂.

* * * * *

Subpart O—[AMENDED]

21. Section 98.153 is amended by:

a. Revising paragraph (c) introductory text.

b. Revising paragraph (d) introductory text.

c. Revising the parameter " E_D " of Equation O-5.

§ 98.153 Calculating GHG emissions.

* * * * *

(c) For HCFC-22 production facilities that do not use a destruction device or that have a destruction device that is not directly connected to the HCFC-22 production equipment, HFC-23 emissions shall be estimated using Equation O-4 of this section:

* * * * *

(d) For HCFC-22 production facilities that use a destruction device connected to the HCFC-22 production equipment, HFC-23 emissions shall be estimated using Equation O-5 of this section:

* * * * *

E_D = Mass of HFC-23 emitted annually from destruction device (metric tons), calculated using Equation O-8 of this section.

* * * * *

22. Section 98.154 is amended by revising paragraph (j) to read as follows:

§ 98.154 Monitoring and QA/QC requirements.

* * * * *

(j) The number of sources of equipment type t with screening values less than 10,000 ppmv shall be the difference between the number of leak sources of equipment type t that

could emit HFC-23 and the number of sources of equipment type t with screening values greater than or equal to 10,000 ppmv as determined under paragraph (i) of this section.

* * * * *

23. Section 98.156 is amended by revising paragraph (c) to read as follows:

§ 98.156 Data reporting requirements.

* * * * *

(c) Each HFC-23 destruction facility shall report the concentration (mass fraction) of HFC-23 measured at the outlet of the destruction device during the facility's annual HFC-23 concentration measurements at the outlet of the device. If the concentration of HFC-23 is below the detection limit of the measuring device, report the detection limit and that the concentration is below the detection limit.

* * * * *

Subpart P—[AMENDED]

24. Section 98.163 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Revising the parameters "Fdstk_n", "CC_n", and "MW_n" of Equation P-1.
- c. Revising the parameters "Fdstk_n" and "CC_n" of Equation P-2.

d. Revising the parameters "Fdstk_n" and "CC_n" of Equation P-3.

§ 98.163 Calculating GHG emissions.

* * * * *

(b) Fuel and feedstock material balance approach. Calculate and report CO₂ emissions as the sum of the annual emissions associated with each fuel and feedstock used for hydrogen production by following paragraphs (b)(1) through (b)(3) of this section. The carbon content and molecular weight shall be obtained from the analyses conducted in accordance with §98.164(b)(2), (b)(3), or (b)(4), as applicable, or from the missing data procedures in §98.165. If the analyses are performed annually, then the annual value shall be used as the monthly average. If the analyses are performed more frequently than monthly, use the arithmetic average of values obtained during the month as the monthly average.

(1) * * *

* * * * *

Fdstk_n = Volume of the gaseous fuel or feedstock used in month n (scf (at standard conditions of 68 °F and atmospheric pressure) of fuel or feedstock).

CC_n = Average carbon content of the gaseous fuel and feedstock for month n (kg carbon per kg of fuel or feedstock).

MW_n = Average molecular weight of the gaseous fuel or feedstock for month n (kg/kg-mole).

* * * * *

(2) * * *

* * * * *

Fdstk_n = Volume of the liquid fuel or feedstock used in month n (gallons of fuel or feedstock).

CC_n = Average carbon content of the liquid fuel or feedstock, for month n (kg carbon per gallon of fuel or feedstock).

* * * * *

(3) * * *

* * * * *

Fdstk_n = Mass of solid fuel or feedstock used in month n (kg of fuel or feedstock).

CC_n = Average carbon content of the solid fuel or feedstock, for month n (kg carbon per kg of fuel or feedstock).

* * * * *

25. Section 98.164 is amended by:

a. Revising paragraphs (b) (3), (b) (4), and (b) (5)

introductory text.

b. Removing paragraphs (c) and (d).

§ 98.164 Monitoring and QA/QC requirements.

* * * * *

(b) * * *

(3) Determine the carbon content of fuel oil, naphtha, and other liquid fuels and feedstocks at least monthly, except annually for standard liquid hydrocarbon fuels and feedstocks having consistent composition, or upon delivery for liquid fuels

and feedstocks delivered by bulk transport (e.g., by truck or rail).

(4) Determine the carbon content of coal, coke, and other solid fuels and feedstocks at least monthly, except annually for standard solid hydrocarbon fuels and feedstocks having consistent composition, or upon delivery for solid fuels and feedstocks delivered by bulk transport (e.g., by truck or rail).

(5) You must use the following applicable methods to determine the carbon content for all fuels and feedstocks, and molecular weight of gaseous fuels and feedstocks. Alternatively, you may use the results of chromatographic analysis of the fuel and feedstock, provided that the chromatograph is operated, maintained, and calibrated according to the manufacturer's instructions; and the methods used for operation, maintenance, and calibration of the chromatograph are documented in the written monitoring plan for the unit under §98.3(g)(5).

* * * * *

26. Section 98.166 is amended by revising paragraphs

(a)(2) and (a)(3) to read as follows:

§ 98.166 Data reporting requirements.

* * * * *

(a) * * *

(2) Annual quantity of hydrogen produced (metric tons) for each process unit.

(3) Annual quantity of ammonia produced (metric tons), if applicable, for each process unit.

* * * * *

27. Section 98.167 is amended by adding paragraphs (c) and (d) to read as follows:

§ 98.167 Records that must be retained.

* * * * *

(c) For units using the calculation methodologies described 98.163(b), the records required under §98.3(g) must include both the company records and a detailed explanation of how company records are used to estimate the following:

(1) Fuel and feedstock consumption, when solid fuel and feedstock is combusted and a CEMS is not used to measure GHG emissions.

(2) Fossil fuel consumption, when, pursuant to §98.33(e), the owner or operator of a unit that uses CEMS to quantify CO₂ emissions and that combusts both fossil and biogenic fuels separately reports the biogenic portion of the total annual CO₂ emissions.

(3) Sorbent usage, if the methodology in §98.33(d) is used to calculate CO₂ emissions from sorbent.

(d) The owner or operator must document the procedures used to ensure the accuracy of the estimates of fuel and feedstock usage and sorbent usage (as applicable) in §98.163(b),

including, but not limited to, calibration of weighing equipment, fuel and feedstock flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be provided.

Subpart Q—[AMENDED]

28. Section 98.170 is amended by revising the first sentence to read as follows:

§ 98.170 Definition of the source category.

The iron and steel production source category includes facilities with any of the following processes: taconite iron ore processing, integrated iron and steel manufacturing, cokemaking not colocated with an integrated iron and steel manufacturing process, direct reduction furnaces not colocated with an integrated iron and steel manufacturing process, and electric arc furnace (EAF) steelmaking not colocated with an integrated iron and steel manufacturing process. * * *

29. Section 98.173 is amended by:

a. Revising the parameters " (F_s) ", " (C_{sf}) ", " (F_g) ", " (F_l) ", " (C_0) ", " (C_p) ", and " (C_R) " of Equation Q-1 in paragraph (b) (1) (i) .

b. Revising the parameters " (C_{Iron}) ", " (C_{Scrap}) ", " (C_{Flux}) ", " (C_{Carbon}) ", " (C_{Steel}) ", " (C_{Slag}) ", and " (C_R) " of Equation Q-2 in paragraph (b) (1) (ii) .

c. Revising the parameters " (C_{Coal}) ", " (C_{Coke}) ", and " (C_{R}) " of Equation Q-3 in paragraph (b)(1)(iii).

d. Revising the parameters " (F_{g}) ", " (C_{Feed}) ", " (C_{Sinter}) ", and " (C_{R}) " of Equation Q-4 in paragraph (b)(1)(iv).

e. Revising paragraph (b)(1)(v).

f. Revising Equation Q-6 and revising the parameters " (C_{Steelin}) ", " (C_{Steelout}) ", and " (C_{R}) " of Equation Q-6 in paragraph (b)(1)(vi).

g. Revising the parameters " (F_{g}) ", " (C_{Ore}) ", " (C_{Carbon}) ", " (C_{Other}) ", " (C_{Iron}) ", " (C_{NM}) ", and " (C_{R}) " of Equation Q-7 in paragraph (b)(1)(vii).

h. Revising paragraphs (c) and (d).

§ 98.173 Calculating GHG emissions.

* * * * *

(b) * * *

(1) * * *

(i) * * *

* * * * *

(F_{s}) = Annual mass of the solid fuel used (metric tons).

(C_{sf}) = Carbon content of the solid fuel, from the fuel analysis (expressed as a decimal fraction).

(F_{g}) = Annual volume of the gaseous fuel used (scf).

* * * * *

(F_{l}) = Annual volume of the liquid fuel used (gallons).

* * * * *

(C_0) = Carbon content of the greenball (taconite) pellets, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_p) = Carbon content of the fired pellets, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(ii) * * *

* * * * *

(C_{Iron}) = Carbon content of the molten iron, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Scrap}) = Carbon content of the ferrous scrap, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Flux}) = Carbon content of the flux materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Carbon}) = Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Steel}) = Carbon content of the steel, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Slag}) = Carbon content of the slag, from the carbon analysis (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(iii) * * *

* * * * *

(C_{Coal}) = Carbon content of the coal, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Coke}) = Carbon content of the coke, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(iv) * * *

* * * * *

(F_g) = Annual volume of the gaseous fuel used (scf).

* * * * *

(C_{Feed}) = Carbon content of the mixed sinter feed materials that form the bed entering the sintering machine,

from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Sinter}) = Carbon content of the sinter pellets, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(v) For EAFs, estimate CO₂ emissions using Equation Q-5 of this section.

$$[CO]_2 = 44/12 * [(Iron) * (C_{Iron}) + (Scrap) * (C_{Scrap}) + (Flux) * (C_{Flux}) + (Electrode) * (C_{Electrode}) + (Carbon) * (C_{Carbon}) - (Steel) * (C_{Steel}) + (F_{dg}) * (Eq. Q-5)]$$

Where:

CO₂ = Annual CO₂ mass emissions from the EAF (metric tons).

44/12 = Ratio of molecular weights, CO₂ to carbon.

(Iron) = Annual mass of direct reduced iron (if any) charged to the furnace (metric tons).

(C_{Iron}) = Carbon content of the direct reduced iron, from the carbon analysis results (expressed as a decimal fraction).

(Scrap) = Annual mass of ferrous scrap charged to the furnace (metric tons).

(C_{Scrap}) = Carbon content of the ferrous scrap, from the carbon analysis results (expressed as a decimal fraction).

(Flux) = Annual mass of flux materials (e.g., limestone, dolomite) charged to the furnace (metric tons).

(C_{Flux}) = Carbon content of the flux materials, from the carbon analysis results (expressed as a decimal fraction).

(Electrode)	=	Annual mass of carbon electrode consumed (metric tons).
(C _{Electrode})	=	Carbon content of the carbon electrode, from the carbon analysis results (expressed as a decimal fraction).
(Carbon)	=	Annual mass of carbonaceous materials (<u>e.g.</u> , coal, coke) charged to the furnace (metric tons).
(C _{Carbon})	=	Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).
(Steel)	=	Annual mass of molten raw steel produced by the furnace (metric tons).
(C _{Steel})	=	Carbon content of the steel, from the carbon analysis results (expressed as a decimal fraction).
(F _g)	=	Annual volume of the gaseous fuel used (scf at 60 degrees F and one atmosphere).
(C _{gf})	=	Average carbon content of the gaseous fuel, from the fuel analysis results (kg C per kg of fuel).
(MW)	=	Molecular weight of the gaseous fuel (kg/kg-mole).
(MVC)	=	Molar volume conversion factor (836.6 scf per kg-mole at standard conditions of 60 degrees F and one atmosphere).
(0.001)	=	Conversion factor from kg to metric tons.
(Slag)	=	Annual mass of slag produced by the furnace (metric tons).
(C _{Slag})	=	Carbon content of the slag, from the carbon analysis results (expressed as a decimal fraction).
(R)	=	Annual mass of air pollution control residue collected (metric tons).
(C _R)	=	Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).
(vi) *	*	*

$$CO_2 = \frac{44}{12} * (Steel) * [(C_{Steelin}) - (C_{Steelout})] - (R) * (C_R) \quad (\text{Eq. Q-6})$$

* * * * *

(C_{Steelin}) = Carbon content of the molten steel before decarburization, from the carbon analysis results (expressed as a decimal fraction).

(C_{Steelout}) = Carbon content of the molten steel after decarburization, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(vii) * * *

* * * * *

(F_g) = Annual volume of the gaseous fuel used (scf).

* * * * *

(C_{Ore}) = Carbon content of the iron ore or iron ore pellets, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Carbon}) = Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Other}) = Average carbon content of the other materials charged to the furnace, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Iron}) = Carbon content of the iron, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{NM}) = Carbon content of the non-metallic materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(c) You must determine emissions of CO₂ from the coke pushing process in mtCO₂e by multiplying the metric tons of coal charged to the by-product recovery and non-recovery coke ovens during the reporting period by 0.008.

(d) If GHG emissions from a taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, or direct reduction furnace are vented through a stack equipped with a CEMS that complies with the Tier 4 methodology in subpart C of this part, or through the same stack as any combustion unit or process equipment that reports CO₂ emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion Sources), then the calculation methodology in paragraph (b) of this section shall not be used to calculate process emissions. The owner or

operator shall report under this subpart the combined stack emissions according to the Tier 4 Calculation Methodology in §98.33(a)(4) and comply with all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

30. Section 98.174 is amended by revising the last sentence of paragraph (b)(1), and revising paragraph (c)(2), to read as follows:

§ 98.174 Monitoring and QA/QC requirements.

* * * *

(b) * * *

(1) * * * Determine the mass rate of fuels using the procedures for combustion units in §98.34. No determination of the mass of steel output from decarburization vessels is required.

* * * *

(c) * * *

(2)(i) For the exhaust from basic oxygen furnaces, EAFs, decarburization vessels, and direct reduction furnaces, sample the furnace exhaust for at least three complete production cycles that start when the furnace is being charged and end after steel or iron and slag have been tapped. For EAFs that produce both carbon steel and stainless or specialty (low

carbon) steel, develop an emission factor for the production of both types of steel.

(ii) For the exhaust from continuously charged EAFs, sample the exhaust for a period spanning at least three hours. For EAFs that produce both carbon steel and stainless or specialty (low carbon) steel, develop an emission factor for the production of both types of steel.

* * * * *

31. Section 98.175 is amended by revising paragraph (a) to read as follows:

§ 98.175 Procedures for estimating missing data.

* * * * *

(a) Except as provided in §98.174(b)(4), 100 percent data availability is required for the carbon content of inputs and outputs for facilities that estimate emissions using the carbon mass balance procedure in §98.173(b)(1) or facilities that estimate emissions using the site-specific emission factor procedure in §98.173(b)(2).

* * * * *

32. Section 98.176 is amended by revising paragraph (e) introductory text to read as follows:

§ 98.176 Data reporting requirements.

* * * * *

(e) If you use the carbon mass balance method in §98.173(b)(1) to determine CO₂ emissions, you must, except as provided in §98.174(b)(4), report the following information for each process:

* * * * *

33. Section 98.177 is amended by revising paragraph (b) to read as follows:

§ 98.177 Records that must be retained.

* * * * *

(b) When the carbon mass balance method is used to estimate emissions for a process, the monthly mass of each process input and output that are used to determine the annual mass, except that no determination of the mass of steel output from decarburization vessels is required.

* * * * *

Subpart S—[AMENDED]

34. Section 98.190 is amended by revising paragraph (a) to read as follows:

§ 98.190 Definition of the source category.

(a) Lime manufacturing plants (LMPs) engage in the manufacture of a lime product by calcination of limestone, dolomite, shells or other calcareous substances as defined in 40 CFR 63.7081(a)(1).

* * * * *

35. Section 98.193 is amended by:

- a. Revising paragraph (a).
- b. Revising paragraph (b)(1).
- c. Revising paragraph (b)(2) introductory text.
- d. Revising paragraph (b)(2)(ii) introductory text.
- e. Revising the parameters " $EF_{LKD,i,n}$ ", " $CaO_{LKD,i,n}$ " and " $MgO_{LKD,i,n}$ " of Equation S-2.
- f. Revising paragraph (b)(2)(iii) introductory text.
- g. Revising the parameters " $E_{waste,i}$ ", " $CaO_{waste,i}$ ", " $MgO_{waste,i}$ ", and " $M_{waste,i}$ " of Equation S-3.
- h. Revising paragraph (b)(2)(iv) introductory text.
- i. Revising the parameters " E_{CO2} ", " $EF_{LKD,i,n}$ ", " $M_{LKD,i,n}$ ", " $E_{waste,i}$ ", "b" and "z" of Equation S-4 to read as follows:

§ 98.193 Calculating GHG emissions.

* * * * *

(a) If all lime kilns meet the conditions specified in §98.33(b)(4)(ii) or (b)(4)(iii), you must calculate and report under this subpart the combined process and combustion CO₂ emissions from all lime kilns by operating and maintaining a CEMS to measure CO₂ emissions according to the Tier 4 Calculation Methodology specified in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) * * *

(1) Calculate and report under this subpart the combined process and combustion CO₂ emissions from all lime kilns by operating and maintaining a CEMS to measure CO₂ emissions from all lime kilns according to the Tier 4 Calculation Methodology specified in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(2) Calculate and report process and combustion CO₂ emissions from all lime kilns separately using the procedures specified in paragraphs (b)(2)(i) through (b)(2)(v) of this section.

* * * * *

(ii) You must calculate a monthly emission factor for each type of calcined byproduct or waste sold (including lime kiln dust) using Equation S-2 of this section:

* * * * *

$EF_{LKD,i,n}$ = Emission factor for calcined lime byproduct or waste type i sold, for month n (metric tons CO₂/ton lime byproduct).

$CaO_{LKD,i,n}$ = Calcium oxide content for calcined lime byproduct or waste type i sold, for month n (metric tons CaO/metric ton lime).

$MgO_{LKD,i,n}$ = Magnesium oxide content for calcined lime byproduct or waste type i sold, for month n (metric tons MgO/metric ton lime).

* * * * *

(iii) You must calculate the annual CO₂ emissions from each type of calcined byproduct or waste that is not sold (including lime kiln dust and scrubber sludge) using Equation S-3 of this section:

* * * * *

$E_{\text{waste},i}$ = Annual CO₂ emissions for calcined lime byproduct or waste type i that is not sold (metric tons CO₂).

* * * * *

$\text{CaO}_{\text{waste},i}$ = Calcium oxide content for calcined lime byproduct or waste type i that is not sold (metric tons CaO/metric ton lime).

$\text{MgO}_{\text{waste},i}$ = Magnesium oxide content for calcined lime byproduct or waste type i that is not sold (metric tons MgO/metric ton lime).

$M_{\text{waste},i}$ = Annual weight or mass of calcined byproducts or wastes for lime type i that is not sold (tons).

* * * * *

(iv) You must calculate annual CO₂ process emissions for all lime kilns using Equation S-4 of this section:

* * * * *

E_{CO_2} = Annual CO₂ process emissions from lime production from all lime kilns (metric tons/year).

* * * * *

$\text{EF}_{\text{LKD},i,n}$ = Emission factor of calcined byproducts or wastes sold for lime type i in calendar month n , (metric tons CO₂/ton byproduct or waste) from Equation S-2 of this section.

$M_{LKD,i,n}$ = Monthly weight or mass of calcined byproducts or waste sold (such as lime kiln dust, LKD) for lime type i in calendar month n (tons).

$E_{waste,i}$ = Annual CO_2 emissions for calcined lime byproduct or waste type i that is not sold (metric tons CO_2) from Equation S-3 of this section.

* * *

b = Number of calcined byproducts or wastes that are sold.

z = Number of calcined byproducts or wastes that are not sold.

* * *

36. Section 98.194 is amended by:

- a. Revising paragraph (a).
- b. Revising paragraph (b).
- c. Revising paragraph (c) introductory text.

§ 98.194 Monitoring and QA/QC requirements.

(a) You must determine the total quantity of each type of lime product that is produced and each calcined byproduct or waste (such as lime kiln dust) that is sold. The quantities of each should be directly measured monthly with the same plant instruments used for accounting purposes, including but not limited to, calibrated weigh feeders, rail or truck scales, and barge measurements. The direct measurements of each lime product shall be reconciled annually with the difference in the beginning of and end of year inventories for these products, when measurements represent lime sold.

(b) You must determine the annual quantity of each calcined byproduct or waste generated that is not sold by either direct measurement using the same instruments identified in paragraph (a) of this section or by using a calcined byproduct or waste generation rate.

(c) You must determine the chemical composition (percent total CaO and percent total MgO) of each type of lime product that is produced and each type of calcined byproduct or waste sold according to paragraph (c)(1) or (2) of this section. You must determine the chemical composition of each type of lime product that is produced and each type of calcined byproduct or waste sold on a monthly basis. You must determine the chemical composition for each type of calcined byproduct or waste that is not sold on an annual basis.

* * * * *

37. Section 98.195 is amended by revising paragraph (a).

§ 98.195 Procedures for estimating missing data.

* * * * *

(a) For each missing value of the quantity of lime produced (by lime type), and quantity of calcined byproduct or waste produced and sold, the substitute data value shall be the best available estimate based on all available process data or data used for accounting purposes.

* * * * *

38. Section 98.196 is amended by revising paragraphs

(a) (1), (a) (2), (a) (4), (a) (5), (a) (7), (b) (1) through
(b) (6), (b) (9), (b) (10), (b) (11), and (b) (14) to read
as follows:

§ 98.196 Data reporting requirements.

* * * * *

(a) * * *

(1) Method used to determine the quantity of lime that is
produced and quantity of lime that is sold.

(2) Method used to determine the quantity of calcined lime
byproduct or waste sold.

* * * * *

(4) Beginning and end of year inventories for calcined lime
byproducts or wastes sold, by type.

(5) Annual amount of calcined lime byproduct or waste sold,
by type (tons).

* * * * *

(7) Annual amount of calcined lime byproduct or waste that
is not sold, by type (tons).

* * * * *

(b) * * *

(1) Annual CO₂ process emissions from all lime kilns
combined (metric tons).

(2) Monthly emission factors (metric ton CO₂/ton lime product) for each lime product type produced.

(3) Monthly emission factors for each calcined byproduct or waste by lime type that is sold.

(4) Standard method used (ASTM or NLA testing method) to determine chemical compositions of each lime type produced and each calcined lime byproduct or waste type.

(5) Monthly results of chemical composition analysis of each type of lime product produced and calcined byproduct or waste sold.

(6) Annual results of chemical composition analysis of each type of lime byproduct or waste that is not sold.

* * * * *

(9) Method used to determine the quantity of calcined lime byproduct or waste sold.

(10) Monthly amount of calcined lime byproduct or waste sold, by type (tons).

(11) Annual amount of calcined lime byproduct or waste that is not sold, by type (tons).

* * * * *

(14) Beginning and end of year inventories for calcined lime byproducts or wastes sold.

* * * * *

Subpart V--[AMENDED]

39. Section 98.222 is amended by revising paragraph (a) to read as follows:

§ 98.222 GHGs to report.

(a) You must report N_2O process emissions from each nitric acid train as required by this subpart.

* * * * *

40. Section 98.223 is amended by:

a. Revising paragraphs (b) introductory text, (b) (1), (b) (3), (d) introductory text, and (e).

b. Revising parameters " $E_{N_2O,t}$ ", " P_t ", " DF ", and " AF " of Equation V-3a.

c. Revising paragraph (g) (2) introductory text.

d. Revising parameters " $E_{N_2O,t}$ ", " $EF_{N_2O,t}$ ", " P_t ", " DF_1 ", " AF_1 ", " DF_2 ", " AF_2 ", " DF_N ", and " AF_N " of Equation V-3b.

e. Revising paragraph (g) (3) introductory text.

f. Revising parameters " $E_{N_2O,t}$ ", " $EF_{N_2O,t}$ ", " P_t ", " DF_N ", " AF_N ", and " FC_N " of Equation V-3c.

g. Revising parameter " $E_{N_2O,t}$ " of Equation V-3d.

h. Revising paragraph (i).

§ 98.223 Calculating GHG emissions.

* * * * *

(b) You must conduct an annual performance test for each nitric acid train according to paragraphs (b) (1) through (b) (3) of this section.

(1) You must conduct the performance test at the absorber tail gas vent, referred to as the test point, for each nitric acid train according to §98.224(b) through (f). If multiple nitric acid trains exhaust to a common abatement technology and/or emission point, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when multiple processes are operating and base the site-specific emission factor on the combined production rate of the multiple nitric acid trains.

* * * * *

(3) You must measure the production rate during the performance test and calculate the production rate for the test period in tons (100 percent acid basis) per hour.

* * * * *

(d) If nitric acid train "t" exhausts to any N₂O abatement technology "N", you must determine the destruction efficiency for each N₂O abatement technology "N" according to paragraphs (d)(1), (d)(2), or (d)(3) of this section.

* * * * *

(e) If nitric acid train "t" exhausts to any N₂O abatement technology "N", you must determine the annual amount of nitric acid produced on nitric acid train "t" while N₂O abatement technology "N" is operating according to §98.224(f). Then you

must calculate the abatement utilization factor for each N₂O abatement technology "N" for each nitric acid train "t" according to Equation V-2 of this section.

* * * *

(g) * *

(1) * *

* * * *

$E_{N_2O_t}$ = Annual N₂O mass emissions from nitric acid train "t" according to this Equation V-3a (metric tons).

* * * *

P_t = Annual nitric acid production from nitric acid train "t" (ton acid produced, 100 percent acid basis).

DF = Destruction efficiency of N₂O abatement technology N that is used on nitric acid train "t" (decimal fraction of N₂O removed from vent stream).

AF = Abatement utilization factor of N₂O abatement technology "N" for nitric acid train "t" (decimal fraction of annual production during which abatement technology is operating).

* * * *

(2) If multiple N₂O abatement technologies are located in series after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual nitric acid production (determined in paragraph (i) of this section), and the abatement utilization factor (determined

in paragraph (e) of this section), according to Equation V-3b of this section:

* * * * *

$E_{N_2O,t}$	=	Annual N_2O mass emissions from nitric acid train "t" according to this Equation V-3b (metric tons).
$EF_{N_2O,t}$	=	N_2O emissions factor for nitric acid train "t" (lb N_2O /ton nitric acid produced).
P_t	=	Annual nitric acid produced from nitric acid train "t" (ton acid produced, 100 percent acid basis).
DF_1	=	Destruction efficiency of N_2O abatement technology 1 (decimal fraction of N_2O removed from vent stream).
AF_1	=	Abatement utilization factor of N_2O abatement technology 1 (decimal fraction of time that abatement technology 1 is operating).
DF_2	=	Destruction efficiency of N_2O abatement technology 2 (decimal fraction of N_2O removed from vent stream).
AF_2	=	Abatement utilization factor of N_2O abatement technology 2 (decimal fraction of time that abatement technology 2 is operating).
DF_N	=	Destruction efficiency of N_2O abatement technology N (decimal fraction of N_2O removed from vent stream).
AF_N	=	Abatement utilization factor of N_2O abatement technology N (decimal fraction of time that abatement technology N is operating).

* * * * *

(3) If multiple N_2O abatement technologies are located in parallel after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in paragraph (d) of this

section), the annual nitric acid production (determined in paragraph (i) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation V-3c of this section:

* * * * *

$E_{N_2O,t}$ = Annual N_2O mass emissions from nitric acid train "t" according to this Equation V-3c (metric tons).

$EF_{N_2O,t}$ = N_2O emissions factor for nitric acid train "t" (lb N_2O /ton nitric acid produced).

P_t = Annual nitric acid produced from nitric acid train "t" (ton acid produced, 100 percent acid basis).

DF_N = Destruction efficiency of N_2O abatement technology "N" (decimal fraction of N_2O removed from vent stream).

AF_N = Abatement utilization factor of N_2O abatement technology "N" (decimal fraction of time that abatement technology "N" is operating).

FC_N = Fraction control factor of N_2O abatement technology "N" (decimal fraction of total emissions from nitric acid train "t" that are sent to abatement technology "N").

* * * * *

(4) * * *

* * * * *

$E_{N_2O,t}$ = Annual N_2O mass emissions from nitric acid train "t" according to this Equation V-3d (metric tons).

* * * * *

(i) You must determine the total annual amount of nitric acid produced on each nitric acid train "t" (tons acid produced, 100 percent acid basis), according to §98.224(f).

41. Section 98.224 is amended by revising paragraphs (c) introductory text, (e), and (f) to read as follows:

§ 98.224 Monitoring and QA/QC requirements.

* * * * *

(c) You must determine the production rate(s) (100 percent acid basis) from each nitric acid train during the performance test according to paragraphs (c)(1) or (c)(2) of this section.

* * * * *

(e) You must determine the total monthly amount of nitric acid produced. You must also determine the monthly amount of nitric acid produced while N₂O abatement technology is operating from each nitric acid train. These monthly amounts are determined according to the methods in paragraphs (c)(1) or (2) of this section.

(f) You must determine the annual amount of nitric acid produced. You must also determine the annual amount of nitric acid produced while N₂O abatement technology is operating for each nitric acid train. These annual amounts are determined by summing the respective monthly nitric acid quantities determined in paragraph (e) of this section.

42. Section 98.226 is amended by:

a. Revising paragraph (a) and paragraph (n) introductory text.

b. Adding and reserving paragraph (o).

c. Revising paragraph (p).

§ 98.226 Data reporting requirements.

* * * * *

(a) Nitric Acid train identification number.

* * * * *

(n) If you requested Administrator approval for an alternative method of determining N₂O emissions under §98.223(a)(2), each annual report must also contain the information specified in paragraphs (n)(1) through (n)(4) of this section for each nitric acid production facility.

* * * * *

(o) [Reserved]

(p) Fraction control factor for each abatement technology (percent of total emissions from the nitric acid train that are sent to the abatement technology) if Equation V-3c is used.

Subpart X—[AMENDED]

43. Section 98.242 is amended by revising paragraph (b)(2) to read as follows:

§ 98.242 GHGs to report.

* * * * *

(b) * * *

(2) If you comply with §98.243(c), report CO₂, CH₄, and N₂O combustion emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C for all fuels, except emissions from burning petrochemical process off-gas in any combustion unit are not to be reported under subpart C of this part. Determine the applicable Tier in subpart C of this part (General Stationary Fuel Combustion Sources) based on the maximum rated heat input capacity of the stationary combustion source.

* * * * *

44. Section 98.243 is amended by:

- a. Revising paragraph (b).
- b. Revising paragraphs (c)(3) and (c)(4).
- c. Revising the parameters " C_g ", " $(F_{gf})_{i,n}$ ", " $(P_{gp})_{i,n}$ ", and " $(MW_p)_i$ " of Equation X-1.
- d. Removing the parameter " $(MW_f)_I$ " of Equation X-1 and adding parameter " $(MW_f)_{i,n}$ " in its place.
- e. Revising paragraph (d)(3)(i).

§ 98.243 Calculating GHG emissions.

* * * * *

(b) Continuous emission monitoring system (CEMS). Route all process vent emissions and emissions from stationary combustion units that burn any amount of process off-gas to one or more

stacks and determine GHG emissions as specified in paragraphs (b)(1) through (3) of this section.

(1) Determine CO₂ emissions from each stack (except flare stacks) according to the Tier 4 Calculation Methodology requirements in subpart C of this part.

(2) For each stack (except flare stacks) that includes emissions from combustion of petrochemical process off-gas, calculate CH₄ and N₂O emissions in accordance with subpart C of this part (use Equation C-10 and the "fuel gas" emission factors in Table C-2 of subpart C of this part).

(3) For each flare, calculate CO₂, CH₄, and N₂O emissions using the methodology specified in §98.253(b)(1) through (b)(3).

(c) * * *

(3) Collect a sample of each feedstock and product at least once per month and determine the carbon content of each sample according to the procedures of §98.244(b)(4). If multiple valid carbon content measurements are made during the monthly measurement period, average them arithmetically. However, if a particular liquid or solid feedstock is delivered in lots, and if multiple deliveries of the same feedstock are received from the same supply source in a given calendar month, only one representative sample is required. Alternatively, you may use the results of analyses conducted by a feedstock supplier, or product customer, provided the sampling and analysis is

conducted at least once per month using any of the procedures specified in §98.244(b)(4).

(4) If you determine that the monthly average concentration of a specific compound in a feedstock or product is greater than 99.5 percent by volume or mass, then as an alternative to the sampling and analysis specified in paragraph (c)(3) of this section, you may determine carbon content in accordance with paragraphs (c)(4)(i) through (iii) of this section.

(i) Calculate the carbon content assuming 100 percent of that feedstock or product is the specific compound.

(ii) Maintain records of any determination made in accordance with this paragraph (c)(4) along with all supporting data, calculations, and other information.

(iii) Reevaluate determinations made under this paragraph (c)(4) after any process change that affects the feedstock or product composition. Keep records of the process change and the corresponding composition determinations. If the feedstock or product composition changes so that the average monthly concentration falls below 99.5 percent, you are no longer permitted to use this alternative method.

(5) * * *

(i) * * *

* * * * *

C_g = Annual net contribution to calculated emissions from carbon (C) in gaseous materials, including streams containing CO₂ recovered for sale or use in another process (kg/yr).

$(F_{gf})_{i,n}$ = Volume or mass of gaseous feedstock i introduced in month "n" (scf or kg). If you measure mass, the term $(MW_f)_i/MVC$ is replaced with "1".

* * *

$(MW_f)_{i,n}$ = Molecular weight of gaseous feedstock i in month "n" (kg/kg-mole).

* * *

$(P_{gp})_{i,n}$ = Volume or mass of gaseous product i produced in month "n" (scf or kg). If you measure mass, the term $(MW_p)_i/MVC$ is replaced with "1".

* * *

$(MW_p)_{i,n}$ = Molecular weight of gaseous product i in month "n" (kg/kg-mole).

* * *

(d) * * *

(3) * * *

(i) For all gaseous fuels that contain ethylene process off-gas, use the emission factors for "Fuel Gas" in Table C-2 of subpart C of this part (General Stationary Fuel Combustion Sources).

* * *

45. Section 98.244 is amended by:

a. Revising the last sentence of paragraph (b) (4) introductory text, and paragraphs (b) (4) (xiii), (b) (4) (xiv), and (b) (4) (xv) (A) .

b. Adding paragraph (c) .

§ 98.244 Monitoring and QA/QC requirements.

* * * * *

(b) * * *

(4) * * * Analyses conducted in accordance with methods specified in paragraphs (b) (4) (i) through (b) (4) (xv) of this section may be performed by the owner or operator, by an independent laboratory, by the supplier of a feedstock, or by a product customer.

* * * * *

(xiii) The results of chromatographic analysis of a feedstock or product, provided that the chromatograph is operated, maintained, and calibrated according to the manufacturer's instructions.

(xiv) The results of mass spectrometer analysis of a feedstock or product, provided that the mass spectrometer is operated, maintained, and calibrated according to the manufacturer's instructions.

(xv) * * *

(A) An industry standard practice or a method published by a consensus-based standards organization if such a method exists

for carbon black feedstock oils and carbon black products.

Consensus-based standards organizations include, but are not limited to, the following: ASTM International (100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428-B2959, (800) 262-1373, <http://www.astm.org>), the American National Standards Institute (ANSI, 1819 L Street, NW., 6th floor, Washington, DC 20036, (202) 293-8020, <http://www.ansi.org>), the American Gas Association (AGA, 400 North Capitol Street, NW., 4th Floor, Washington, DC 20001, (202) 824-7000, <http://www.aga.org>), the American Society of Mechanical Engineers (ASME, Three Park Avenue, New York, NY 10016-5990, (800) 843-2763, <http://www.asme.org>), the American Petroleum Institute (API, 1220 L Street, NW., Washington, DC 20005-4070, (202) 682-8000, <http://www.api.org>), and the North American Energy Standards Board (NAESB, 801 Travis Street, Suite 1675, Houston, TX 77002, (713) 356-0060, <http://www.naesb.org>). The method(s) used shall be documented in the monitoring plan required under § 98.3(g)(5).

* * * * *

(c) If you comply with §98.243(b) or (d), conduct monitoring and QA/QC for flares in accordance with §98.254.

46. Section 98.245 is revised to read as follows:

§ 98.245 Procedures for estimating missing data.

For missing feedstock and product flow rates, use the same procedures as for missing fuel usage as specified in §98.35(b)(2). For missing feedstock and product carbon contents and missing molecular weights for gaseous feedstocks and products, use the same procedures as for missing carbon contents and missing molecular weights for fuels as specified in §98.35(b)(1). For missing flare data, follow the procedures in §98.255(b) and (c).

47. Section 98.246 is amended by:

a. Revising paragraphs (a)(6), (a)(8), (a)(9), (a)(11) introductory text, (b)(2), (b)(4), and (b)(5).

b. Removing and reserving paragraphs (b)(5)(i) through (iv), and (b)(6).

c. Revising paragraph (c)(4).

§ 98.246 Data reporting requirements.

* * * * *

(a) * * *

(6) For each feedstock and product, provide the information specified in paragraphs (a)(6)(i) through (a)(6)(iii) of this section.

(i) Name of each method used to determine carbon content or molecular weight in accordance with 98.244(b)(4);

(ii) Description of each type of device (e.g., flow meter, weighing device) used to determine flow or mass in accordance 98.244(b)(1) through (3).

(iii) Identification of each method (i.e., method number, title, or other description) used to determine flow or mass in accordance with 98.244(b)(1) through (3).

* * * * *

(8) Identification of each combustion unit that burned both process off-gas and supplemental fuel, including combustion units that are not part of the petrochemical process unit.

(9) If you comply with the alternative to sampling and analysis specified in §98.243(c)(4), the number of days during which off-specification product was produced, and if applicable, the date of any process change that reduced the composition to less than 99.5 percent.

* * * * *

(11) If you determine carbon content or composition of a feedstock or product using a method under §98.244(b)(4)(xv)(B), report the information listed in paragraphs (a)(11)(i) through (a)(11)(iii) of this section. Include the information in paragraph (a)(11)(i) of this section in each annual report. Include the information in paragraphs (a)(11)(ii) and (a)(11)(iii) of this section only in the first applicable annual

report, and provide any changes to this information in subsequent annual reports.

* * * * *

(b) * * *

(2) For CEMS used on stacks that include emissions from stationary combustion units that burn any amount of off-gas from the petrochemical process, report the relevant information required under §98.36(c)(2) and (e)(2)(vi) for the Tier 4 calculation methodology. Sections §98.36(c)(2)(ii) and (c)(2)(ix) do not apply for the purposes of this subpart.

(3) For CEMS used on stacks that do not include emissions from stationary combustion units, report the information required under §98.36(b)(6), (b)(7), and §98.36(e)(2)(vi).

(4) For each CEMS monitoring location that meets the conditions in paragraph (b)(2) or (3) of this section, provide an estimate based on engineering judgment of the fraction of the total CO₂ emissions that is attributable to the petrochemical process unit.

(5) For each CEMS monitoring location that meets the conditions in paragraph (b)(2) of this section, report the CH₄ and N₂O emissions expressed in metric tons of each gas. For each CEMS monitoring location provide an estimate based on engineering judgment of the fraction of the total CH₄ and N₂O

emissions that is attributable to combustion of off-gas from the petrochemical process unit.

(i) [Reserved]

(ii) [Reserved]

(iii) [Reserved]

(iv) [Reserved]

(6) [Reserved]

* * * * *

(c) * * *

(4) Name and annual quantity of each feedstock (metric tons).

* * * * *

48. Section 98.247 is amended by revising paragraphs (b) introductory text and (b) (2) to read as follows:

§ 98.247 Records that must be retained.

* * * * *

(b) If you comply with the mass balance methodology in §98.243(c), then you must retain records of the information listed in paragraphs (b) (1) through (b) (4) of this section.

* * * * *

(2) Start and end times for time periods when off-specification product is produced, if you comply with the alternative methodology in §98.243(c) (4) for determining carbon content of product.

* * * * *

49. Section 98.248 is amended by revising the definition of "Product" to read as follows:

§ 98.248 Definitions.

* * * * *

Product, as used in §98.243, means each of the following carbon-containing outputs from a process: the petrochemical, recovered byproducts, and liquid organic wastes that are not combusted onsite. Product does not include process vent emissions, fugitive emissions, or wastewater.

Subpart Y—[AMENDED]

50. Section 98.252 is amended by revising the parenthetical phrase preceding the last two sentences in paragraph (a) introductory text, and revising paragraph (i), to read as follows:

§ 98.252 GHGs to report.

* * * * *

(a) * * * (Use the default CH₄ and N₂O emission factors for "Fuel Gas" in Table C-2 of this part. For Tier 3, use either the default high heat value for fuel gas in Table C-1 of subpart C of this part or a calculated HHV, as allowed in Equation C-8 of subpart C of this part.) * * *

* * * * *

(i) CO₂ emissions from non-merchant hydrogen production process units (not including hydrogen produced from catalytic reforming units) following the calculation methodologies, monitoring and QA/QC methods, missing data procedures, reporting requirements, and recordkeeping requirements of subpart P of this part.

51. Section 98.253 is amended by:

- a. Revising the parameter "EmFCH₄" to Equation Y-4 and "EmFN₂O" to Equation Y-5.
- b. Revising paragraphs (f)(2), (f)(3), and (f)(4) introductory text.
- c. Revising parameters "F_{SG}" and "MF_c" to Equation Y-12.
- d. Revising paragraphs (j) introductory text, (k) introductory text, and (m) introductory text.

§ 98.253 Calculating GHG emissions.

* * * * *

(b) * * *

(2) * * *

* * * * *

EmFCH₄ = Default CH₄ emission factor for "Fuel Gas" from Table C-2 of subpart C of this part (General Stationary Fuel Combustion Sources) (kg CH₄/MMBtu).

* * * * *

(3) * * *

* * * * *

EmF_{N_2O} = Default N_2O emission factor for "Fuel Gas" from Table C-2 of subpart C of this part (General Stationary Fuel Combustion Sources) (kg N_2O /MMBtu).

* * * * *

(f) * * *

(2) Flow measurement. If you have a continuous flow monitor on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site sulfur recovery, you must use the measured flow rates when the monitor is operational to calculate the sour gas flow rate. If you do not have a continuous flow monitor on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site sulfur recovery, you must use engineering calculations, company records, or similar estimates of volumetric sour gas flow.

(3) Carbon content. If you have a continuous gas composition monitor capable of measuring carbon content on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site for sulfur recovery, or if you monitor gas composition for carbon content on a routine basis, you must use the measured carbon content value. Alternatively, you may develop a site-specific carbon content factor using limited measurement data or engineering estimates or use the default factor of 0.20.

(4) Calculate the CO₂ emissions from each on-site sulfur recovery plant and for sour gas sent off-site for sulfur recovery using Equation Y-12 of this section.

* * * * *

F_{SG} = Volumetric flow rate of sour gas (including sour water stripper gas) fed to the sulfur recovery plant or the sour gas feed sent for off-site for sulfur recovery (scf/year).

* * * * *

MF_C = Mole fraction of carbon in the sour gas fed to the sulfur recovery plant or the sour gas feed sent for off-site for sulfur recovery (kg-mole C/kg-mole gas); default = 0.20.

* * * * *

(j) For each process vent not covered in paragraphs (a) through (i) of this section that can reasonably be expected to contain greater than 2 percent by volume CO₂ or greater than 0.5 percent by volume of CH₄ or greater than 0.01 percent by volume (100 parts per million) of N₂O, calculate GHG emissions using the Equation Y-19 of this section. You must also use Equation Y-19 of this section to calculate CH₄ emissions for catalytic reforming unit depressurization and purge vents when methane is used as the purge gas, CH₄ emissions if you elected to use the method in paragraph (i)(1) of this section, and CO₂ and/or CH₄ emissions, as applicable, if you elected this method as an alternative to the methods in paragraphs (f), (h), or (k) of this section.

* * * * *

(k) For uncontrolled blowdown systems, you must calculate CH₄ emissions either using the methods for process vents in paragraph (j) of this section regardless of the CH₄ concentration or using Equation Y-20 of this section. Blowdown systems where the uncondensed gas stream is routed to a flare or similar control device is considered to be controlled and is not required to estimate emissions under this paragraph (k).

* * * * *

(m) For storage tanks, except as provided in paragraph (m)(3) of this section, calculate CH₄ emissions using the applicable methods in paragraphs (m)(1) and (m)(2) of this section.

* * * * *

52. Section 98.256 is amended by:

- a. Revising paragraphs (f)(6), (h) introductory text, (h)(2), (h)(3), (h)(4), (h)(5), and (h)(6).
- b. Adding paragraph (j)(10).
- c. Revising paragraph (k)(4).
- d. Adding paragraph (k)(6).
- e. Revising paragraph (o)(4)(vi).
- f. Removing and reserving paragraphs (o)(5) through (7).

§ 98.256 Data reporting requirements.

* * * * *

(f) * * *

(6) If you use a CEMS, the relevant information required under §98.36 for the Tier 4 Calculation Methodology, the CO₂ annual emissions as measured by the CEMS (unadjusted to remove CO₂ combustion emissions associated with additional units, if present) and the process CO₂ emissions as calculated according to §98.253(c)(1)(ii). Report the CO₂ annual emissions associated with sources other than those from the coke burn-off in accordance with the applicable subpart (e.g., subpart C of this part in the case of a CO boiler).

* * * * *

(h) For on-site sulfur recovery plants and for emissions from sour gas sent off-site for sulfur recovery, the owner and operator shall report:

* * * * *

(2) For each on-site sulfur recovery plant, the maximum rated throughput (metric tons sulfur produced/stream day), a description of the type of sulfur recovery plant, and an indication of the method used to calculate CO₂ annual emissions for the sulfur recovery plant (e.g., CO₂ CEMS, Equation Y-12, or process vent method in §98.253(j)).

(3) The calculated CO₂ annual emissions for each on-site sulfur recovery plant, expressed in metric tons. The calculated

annual CO₂ emissions from sour gas sent off-site for sulfur recovery, expressed in metric tons.

(4) If you use Equation Y-12 of this subpart, the annual volumetric flow to the on-site and off-site sulfur recovery plant (in scf/year), the molar volume conversion factor (in scf/kg-mole), and the annual average mole fraction of carbon in the sour gas (in kg-mole C/kg-mole gas).

(5) If you recycle tail gas to the front of an on-site sulfur recovery plant, indicate whether the recycled flow rate and carbon content are included in the measured data under §98.253(f)(2) and (3). Indicate whether a correction for CO₂ emissions in the tail gas was used in Equation Y-12. If so, then report the value of the correction, the annual volume of recycled tail gas (in scf/year) and the annual average mole fraction of carbon in the tail gas (in kg-mole C/kg-mole gas). Indicate whether you used the default (95%) or a unit specific correction, and if a unit specific correction is used, report the approach used.

(6) If you use a CEMS, the relevant information required under §98.36 for the Tier 4 Calculation Methodology, the CO₂ annual emissions as measured by the CEMS and the annual process CO₂ emissions calculated according to §98.253(f)(1). Report the CO₂ annual emissions associated with fuel combustion in

accordance with subpart C of this part (General Stationary Fuel Combustion Sources).

* * * * *

(j) * * *

(10) If you use Equation Y-19 of this subpart, the relevant information required under paragraph (1)(5) of this section.

(k) * * *

(4) For each set of coking drums that are the same dimensions: The number of coking drums in the set, the height and diameter of the coke drums (in feet), the cumulative number of vessel openings for all delayed coking drums in the set, the typical venting pressure (in psig), void fraction (in cf gas/cf of vessel), and the mole fraction of methane in coking gas (in kg-mole CH₄/kg-mole gas, wet basis).

* * * * *

(6) If you use Equation Y-19 of this subpart, the relevant information required under paragraph (1)(5) of this section for each set of coke drums or vessels of the same size.

* * * * *

(o) * * *

(4) * * *

(vi) If you did not use Equation Y-23, the tank-specific methane composition data and the annual gas generation volume

(scf/yr) used to estimate the cumulative CH₄ emissions for storage tanks used to process unstabilized crude oil.

(5) [Reserved]

(6) [Reserved]

(7) [Reserved]

* * * * *

Subpart Z—[AMENDED]

53. Section 98.263 is amended by revising paragraph

(b) (1) (ii) introductory text and the parameter " $CO_{2n,i}$ "

of Equation Z-1b to read as follows:

§ 98.263 Calculating GHG emissions.

* * * * *

(b) * * *

(1) * * *

(ii) If your process measurement provides the CO₂ content directly as an output, calculate and report the process CO₂ emissions from each wet-process phosphoric acid process line using Equation Z-1b of this section:

* * * * *

$CO_{2n,i}$ = Carbon dioxide content of a grab sample batch of phosphate rock by origin i obtained during month n (percent by weight, expressed as a decimal fraction).

* * * * *

54. Section 98.264 is amended by revising paragraphs (a) and (b) to read as follows:

§ 98.264 Monitoring and QA/QC requirements.

(a) You must obtain a monthly grab sample of phosphate rock directly from the rock being fed to the process line before it enters the mill using one of the following methods. You may conduct the representative bulk sampling using a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by the Association of Fertilizer and Phosphate Chemists (AFPC). If phosphate rock is obtained from more than one origin in a month, you must obtain a sample from each origin of rock or obtain a composite representative sample.

(b) You must determine the carbon dioxide or inorganic carbon content of each monthly grab sample of phosphate rock (consumed in the production of phosphoric acid). You may use a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by AFPC.

* * * * *

55. Section 98.265 is amended by adding introductory text and revising paragraph (a) to read as follows:

§ 98.265 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG emissions calculations is required. Therefore, whenever a quality-assured value of a required parameter is unavailable, a substitute data value for the missing parameter must be used in the calculations as specified in paragraphs (a) and (b) of this section.

(a) For each missing value of the inorganic carbon content or CO₂ content of phosphate rock (by origin), you must use the appropriate default factor provided in Table Z-1 of this subpart. Alternatively, you must determine a substitute data value by calculating the arithmetic average of the quality-assured values of inorganic carbon contents or CO₂ contents of phosphate rock of origin i (see Equation Z-1a or Z-1b of this subpart) from samples immediately preceding and immediately following the missing data incident. If no quality-assured data on inorganic carbon contents or CO₂ contents of phosphate rock of origin i are available prior to the missing data incident, the substitute data value shall be the first quality-assured value for inorganic carbon contents or CO₂ contents for phosphate rock of origin i obtained after the missing data period.

* * * * *

56. Section 98.266 is amended by revising paragraphs (a), (b), (d), (f)(5), (f)(6), and (f)(8) to read as follows:

§ 98.266 Data reporting requirements.

* * * * *

(a) Annual phosphoric acid production, by origin of the phosphate rock (tons).

(b) Annual phosphoric acid production capacity (tons).

* * * * *

(d) Annual phosphate rock consumption from monthly measurement records by origin (tons).

* * * * *

(f) * * *

(5) Monthly inorganic carbon content of phosphate rock for each wet-process phosphoric acid process line for which Equation Z-1a is used (percent by weight, expressed as a decimal fraction), or CO₂ content (percent by weight, expressed as a decimal fraction) for which Equation Z-1b is used.

(6) Monthly mass of phosphate rock consumed, by origin, in production for each wet-process phosphoric acid process line (tons).

* * * * *

(8) Number of times missing data procedures were used to estimate phosphate rock consumption (months), inorganic carbon

contents of the phosphate rock (months), and CO₂ contents of the phosphate rock (months).

* * * * *

57. Section 98.267 is amended by revising paragraphs (a) and (c) to read as follows:

§ 98.267 Records that must be retained.

* * * * *

(a) Monthly mass of phosphate rock consumed by origin (tons).

* * * * *

(c) Documentation of the procedures used to ensure the accuracy of monthly phosphate rock consumption by origin.

Subpart AA—[AMENDED]

58. Section 98.273 is amended by revising paragraph (a)(3) introductory text and the parameter "(EF)" of Equation AA-1 to read as follows:

§ 98.273 Calculating GHG emissions.

(a) * * *

(3) Calculate biogenic CO₂ emissions and emissions of CH₄ and N₂O from biomass using measured quantities of spent liquor solids fired, site-specific HHV, and default emissions factors, according to Equation AA-1 of this section:

* * * * *

(EF) = Default emission factor for CO₂, CH₄, or N₂O, from Table AA-1 of this subpart (kg CO₂, CH₄, or N₂O per mmBtu).

* * * * *

59. Section 98.276 is amended by revising paragraphs (e) and (k) to read as follows:

§ 98.276 Data reporting requirements.

* * * * *

(e) The default emission factor for CO₂, CH₄, or N₂O, used in Equation AA-1 of this subpart (kg CO₂, CH₄, or N₂O per mmBtu).

* * * * *

(k) Annual production of pulp and/or paper products produced (metric tons) as follows:

(1) Report the total annual production of unbleached virgin pulp produced onsite during the reporting year in air-dried metric tons per year. This total annual production value is the sum of all kraft, semichemical, soda, and sulfite pulp produced onsite, prior to bleaching, through all virgin pulping lines.

(i) Do not include secondary fiber repulped for paper production in the virgin pulp production total.

(ii) You must report a positive (non-zero) value for pulp production unless your pulp mill did not operate during the reporting year.

(2) Report the total annual production of paper products exiting the paper machine(s), prior to application of any off-

machine coatings, in air-dried metric tons per year. If you operate multiple paper machines, report the sum (total) of the air-dried metric tons of paper produced during the reporting year for all paper machines at the mill.

60. Tables AA-1 and AA-2 are revised to read as follows:

Table AA-1 to Subpart AA of Part 98—Kraft Pulping Liquor Emissions Factors for Biomass-Based CO₂, CH₄, and N₂O

Wood furnish	Biomass-based emissions factors (kg/mmBtu HHV)		
	CO ₂ ^a	CH ₄	N ₂ O
North American Softwood	94.4	0.0019	0.00042
North American Hardwood	93.7	0.0019	0.00042
Bagasse	95.5	0.0019	0.00042
Bamboo	93.7	0.0019	0.00042
Straw	95.1	0.0019	0.00042

^aIncludes emissions from both the recovery furnace and pulp mill lime kiln.

Table AA-2 to Subpart AA of Part 98—Kraft Lime Kiln and Calciner Emissions Factors for CH₄ and N₂O

Fuel	Fossil fuel-based emissions factors (kg/mmBtu HHV)			
	Kraft lime kilns		Kraft calciners	
	CH ₄	N ₂ O	CH ₄	N ₂ O
Residual Oil (any type)	0.0027	0	0.0027	0.0003
Distillate Oil (any type)	0.0027	0	0.0027	0.0004
Natural Gas	0.0027	0	0.0027	0.0001
Biogas	0.0027	0	0.0027	0.0001
Petroleum coke	0.0027	0	NA ^a	NA ^a
Other Fuels	See Table C-2	0	See Table C-2	See Table C-2

^aEmission factors for kraft calciners are not available.

Subpart BB—[AMENDED]

61. Section 98.282 is amended by revising paragraph (a) to read as follows:

§ 98.282 GHGs to report.

* * * * *

(a) CO₂ process emissions from all silicon carbide process units or furnaces combined.

* * * * *

62. Section 98.283 is amended by:

- a. Revising the introductory text.
- b. Revising paragraphs (a), (b) introductory text, and (b) (2) introductory text.
- c. Revising the parameter "T_n" in Equation BB-2.
- d. Removing paragraph (d).

§ 98.283 Calculating GHG emissions.

You must calculate and report the combined annual process CO₂ emissions from all silicon carbide process units and production furnaces using the procedures in either paragraph (a) or (b) of this section.

(a) Calculate and report under this subpart the combined annual process CO₂ emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology specified in §98.33(a) (4) and all associated requirements for Tier 4 in

subpart C of this part (General Stationary Fuel Combustion Sources).

(b) Calculate and report under this subpart the combined annual process CO₂ emissions using the procedures in paragraphs (b)(1) and (b)(2) of this section.

* * * * *

(2) Calculate annual CO₂ process emissions from the silicon carbide production facility according to Equation BB-2 of this section:

* * * * *

T_n = Petroleum coke consumption in calendar month n (tons).

* * * * *

63. Section 98.286 is amended by revising paragraph (b) introductory text to read as follows:

§ 98.286 Data reporting requirements.

* * * * *

(b) If a CEMS is not used to measure process CO₂ emissions, you must report the information in paragraph (b)(1) through (b)(8) of this section for all silicon carbide process units or production furnaces combined:

* * * * *

Subpart DD—[AMENDED]

64. Section 98.304 is amended by revising paragraphs

(c)(1) and (c)(2) to read as follows:

§ 98.304 Monitoring and QA/QC requirements.

* * * * *

(c) * * *

(1) Ensure that cylinders returned to the gas supplier are consistently weighed on a scale that is certified to be accurate and precise to within 2 pounds of true weight and is periodically recalibrated per the manufacturer's specifications. Either measure residual gas (the amount of gas remaining in returned cylinders) or have the gas supplier measure it. If the gas supplier weighs the residual gas, obtain from the gas supplier a detailed monthly accounting, within ± 2 pounds, of residual gas amounts in the cylinders returned to the gas supplier.

(2) Ensure that cylinders weighed for the beginning and end of year inventory measurements are weighed on a scale that is certified to be accurate and precise to within 2 pounds of true weight and is periodically recalibrated per the manufacturer's specifications. All scales used to measure quantities that are to be reported under §98.306 must be calibrated using calibration procedures specified by the scale manufacturer. Calibration must be performed prior to the first reporting year.

After the initial calibration, recalibration must be performed at the minimum frequency specified by the manufacturer.

* * * * *

Subpart FF—[AMENDED]

65. Section 98.320 is amended by revising paragraphs

(b)(1) and (b)(2) to read as follows:

§ 98.320 Definition of the source category.

* * * * *

(b) * * *

(1) Each ventilation system shaft or vent hole, including both those points where mine ventilation air is emitted and those where it is sold, used onsite, or otherwise destroyed (including by ventilation air methane (VAM) oxidizers).

(2) Each degasification system well or gob gas vent hole, including degasification systems deployed before, during, or after mining operations are conducted in a mine area. This includes both those wells and vent holes where coal bed gas is emitted, and those where the gas is sold, used onsite, or otherwise destroyed (including by flaring).

* * * * *

66. Section 98.322 is amended by revising paragraphs (b)

and (d) to read as follows:

§ 98.322 GHGs to report.

* * * * *

(b) You must report CH₄ destruction from systems where gas is sold, used onsite, or otherwise destroyed (including by VAM oxidation and by flaring).

* * * * *

(d) You must report under this subpart the CO₂ emissions from coal mine gas CH₄ destruction occurring at the facility, where the gas is not a fuel input for energy generation or use (e.g., flaring and VAM oxidation).

* * * * *

67. Section 98.323 is amended by:

a. Revising parameters "V", "MCF", "(f_{H2O})", and "P" of Equation FF-2.

b. Revising paragraphs (a)(2) and (b)(1).

c. Revising Equation FF-3 and parameters "V_i", "MCF_i", "P_i", and "(f_{H2O})" of Equation FF-3.

d. Removing parameter "(CH_{4D})" of Equation FF-4 and adding parameter "(CH_{4D})_{i,j}" in its place.

e. Revising paragraph (c) introductory text and Equation FF-6.

§ 98.323 Calculating GHG emissions.

(a) * * *

* * * * *

V = Volumetric flow rate for the quarter (acfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically

corrects to standard temperature and pressure, then use scfm and replace " $520^{\circ}\text{R}/T \times P/1 \text{ atm}$ " with "1".

MCF = Moisture correction factor for the measurement period, volumetric basis.

= 1 when V and C are measured on a dry basis or if both are measured on a wet basis. = $1 - (f_{\text{H}_2\text{O}})$ when V is measured on a wet basis and C is measured on a dry basis. = $1/[1 - (f_{\text{H}_2\text{O}})]$ when V is measured on a dry basis and C is measured on a wet basis.

$(f_{\text{H}_2\text{O}})$ = Moisture content of the methane emitted during the measurement period, volumetric basis (cubic feet water per cubic feet emitted gas).

* * *

P = Absolute pressure at which flow is measured (atm) for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.

* * *

(2) Values of V, C, T, P, and $(f_{\text{H}_2\text{O}})$, if applicable, must be based on measurements taken at least once each quarter with no fewer than 6 weeks between measurements. If measurements are taken more frequently than once per quarter, then use the average value for all measurements taken. If continuous measurements are taken, then use the average value over the time period of continuous monitoring.

* * *

(b) * *

$$\text{CH}_4 = \sum_{i=1}^n \left(V_i \cdot \text{MCF}_i \cdot \frac{C_i}{100\%} \cdot 0.0423 \cdot \frac{520^{\circ}\text{R}}{T_i} \cdot \frac{P_i}{1\text{atm}} \cdot 1,440 \cdot \frac{0.454}{1,000} \right) \quad (\text{Eq. FF-3})$$

* * *

V_i = Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter (acfm). If a flow rate meter is used and the meter automatically corrects to standard temperature and pressure, then use scfm and replace " $520^\circ\text{R}/T_i \times P_i/1 \text{ atm}$ " with "1".

MCF_i = Moisture correction factor for the measurement period, volumetric basis.
 = 1 when V_i and C_i are measured on a dry basis or if both are measured on a wet basis. = $1 - (f_{\text{H}_2\text{O}})_i$ when V_i is measured on a wet basis and C_i is measured on a dry basis. = $1/[1 - (f_{\text{H}_2\text{O}})_i]$ when V_i is measured on a dry basis and C_i is measured on a wet basis.

$(f_{\text{H}_2\text{O}})$ = Moisture content of the CH_4 emitted during the measurement period, volumetric basis (cubic feet water per cubic feet emitted gas)

* * * * *

P_i = Absolute pressure at which flow is measured (atm).

* * * * *

(1) Values for V , C , T , P , and $(f_{\text{H}_2\text{O}})$, if applicable, must be based on measurements taken at least once each calendar week with at least 3 days between measurements. If measurements are taken more frequently than once per week, then use the average value for all measurements taken that week. If continuous measurements are taken, then use the average values over the time period of continuous monitoring when the continuous monitoring equipment is properly functioning.

(2) * * *

* * * * *

$(CH_4D)_{i,j}$ = Weekly CH_4 liberated from a degasification monitoring point (metric tons CH_4).

* * * * *

(c) If gas from a degasification system or ventilation system is sold, used onsite, or otherwise destroyed (including by flaring or VAM oxidation), you must calculate the quarterly CH_4 destroyed for each destruction device and each point of offsite transport to a destruction device, using Equation FF-5 of this section. You must measure CH_4 content and flow rate according to the provisions in §98.324, and calculate the methane routed to the destruction device (CH_4) using either Equation FF-1 or Equation FF-4 of this section, as applicable.

* * * * *

(1) * * *

$$CH_{4Destroyed\ Total} = \sum_{i=1}^d (CH_{4Destroyed})_i \quad (\text{Eq. FF-6})$$

* * * * *

68. Section 98.324 is amended by revising paragraphs (b) introductory text, (c)(2), and parameter " C_{CH_4} " of Equation FF-9 to read as follows:

§ 98.324 Monitoring and QA/QC requirements.

* * * * *

(b) For CH_4 liberated from ventilation systems, determine whether CH_4 will be monitored from each ventilation shaft and vent hole, from a centralized monitoring point, or from a

combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one ventilation point, as long as emissions from all are addressed, and the methodology for calculating total emissions documented. Monitor by one of the following options:

* * * * *

(c) * * *

(2) Collect weekly (once each calendar week, with at least three days between measurements) or more frequent samples, for all degasification wells and gob gas vent holes. Determine weekly or more frequent flow rates, methane concentration, temperature, and pressure from these degasification wells and gob gas vent holes. Methane composition should be determined either by submitting samples to a lab for analysis, or from the use of methanometers at the degasification monitoring site. Follow the sampling protocols for sampling of methane emissions from ventilation shafts, as described in §98.324(b)(1). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

* * * * *

(d) * * *

(2) * * *

(iii) * * *

* * * * *

C_{CH_4} = Methane (CH_4) concentration in the gas (volume %) for use in Equations FF-1 and FF-3 of this subpart.

* * * * *

69. Section 98.326 is amended by revising paragraphs (a), (f), (h), (i), (j), (o), and (r), and adding paragraphs (r)(1), (r)(2), (r)(3), (t), and (u) to read as follows:

§ 98.326 Data reporting requirements.

* * * * *

(a) Quarterly CH_4 liberated from each ventilation monitoring point, (metric tons CH_4).

* * * * *

(f) Quarterly volumetric flow rate for each ventilation monitoring point and units of measure (scfm or acfm), date and location of each measurement, and method of measurement (quarterly sampling or continuous monitoring), used in Equation FF-1 of this subpart.

* * * * *

(h) Weekly volumetric flow rate used to calculate CH_4 liberated from degasification systems and units of measure (acfm or scfm), and method of measurement (sampling or continuous monitoring), used in Equation FF-3 of this subpart.

(i) Quarterly CH₄ concentration (%) used to calculate CH₄ liberated from degasification systems and if the data is based on CEMS or weekly sampling.

(j) Weekly volumetric flow rate used to calculate CH₄ destruction for each destruction device and each point of offsite transport, and units of measure (acfm or scfm).

* * * * *

(o) Temperatures (°R), pressure (atm), moisture content, and the moisture correction factor (if applicable) used in Equation FF-1 and FF-3 of this subpart; and the gaseous organic concentration correction factor, if Equation FF-9 was required.

* * * * *

(r) Identification information and description for each well and shaft, including paragraphs (r)(1) through (r)(3) of this section:

(1) Indication of whether the well or shaft is monitored individually, or as part of a centralized monitoring point. Note which method (sampling or continuous monitoring) was used.

(2) Start date and close date of each well or shaft.

(3) Number of days the well or shaft was in operation during the reporting year.

* * * * *

(t) Quarterly CH₄ routed to each destruction device or offsite transfer point used in Equation FF-5 of this subpart (metric tons).

(u) Mine Safety and Health Administration (MSHA) identification for this coal mine.

Subpart HH—[AMENDED]

70. Section 98.343 is amended by:

a. Revising the parameters "DOC" and "F" of Equation HH-1.

b. Revising Equation HH-4 and the parameters "N" and "0.0423" of Equation HH-4.

c. Revising paragraphs (b)(2)(i), (b)(2)(ii), (b)(2)(iii)(A), and (b)(2)(iii)(B).

d. Revising parameter "OX" of Equation HH-5 at paragraph (c)(1).

e. Revising paragraphs (c)(3)(i) and (c)(3)(ii).

§ 98.343 Calculating GHG emissions.

(a)	*	*	*	
(1)	*	*	*	
*	*	*	*	*
DOC	=	Degradable organic carbon from Table HH-1 of this subpart [fraction (metric tons C/metric ton waste)].		
*	*	*	*	*

F = Fraction by volume of CH₄ in landfill gas from measurement data for the current reporting year, if available (fraction, dry basis, corrected to 0 percent oxygen); otherwise, use the default of 0.5.

* * *

(b) * *

(1) * *

$$R = \sum_{n=1}^N \left((V)_n \times (K_{MC})_n \times \frac{(C_{CH_4})_n}{100\%} \times 0.0423 \times \frac{520^\circ R}{(T)_n} \times \frac{(P)_n}{1 \text{ atm}} \times \frac{0.454}{1,000} \right) \quad (\text{Eq. HH-4})$$

* * *

N = Total number of measurement periods in a year. Use daily averaging periods for a continuous monitoring system and N = 365 (or N = 366 for leap years). For monthly sampling, as provided in paragraph (b) (2) of this section, use N=12.

* * *

0.0423 = Density of CH₄ lb/cf at 520°R or 60 degrees Fahrenheit and 1 atm.

* * *

(2) * *

(i) Continuously monitor gas flow rate and determine the cumulative volume of landfill gas each month and the cumulative volume of landfill gas each year that is collected and routed to a destruction device (before any treatment equipment). Under this option, the gas flow meter is not required to automatically correct for temperature, pressure, or, if necessary, moisture content. If the gas flow meter is not equipped with automatic

correction for temperature, pressure, or, if necessary, moisture content, you must determine these parameters as specified in paragraph (b)(2)(iii) of this section.

(ii) Determine the CH_4 concentration in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(iii) * * *

(A) Determine the temperature and pressure in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(B) If the CH_4 concentration is determined on a dry basis and flow is determined on a wet basis or CH_4 concentration is determined on a wet basis and flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar

month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(c) * * *

(1) * * *

* * * * *

OX = Oxidation fraction. Use the appropriate oxidation fraction default value from Table HH-4 of this subpart.

* * * * *

(3) * * *

(i) Calculate CH₄ emissions from the modeled CH₄ generation and measured CH₄ recovery using Equation HH-6 of this section.

$$\text{Emissions} = \left[\left(G_{\text{CH}_4} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times \left(1 - (\text{DE}_n \times f_{\text{Dest},n}) \right) \right\} \right] \text{ (Eq. HH-6)}$$

Where:

Emissions = Methane emissions from the landfill in the reporting year (metric tons CH₄).

G_{CH₄} = Modeled methane generation rate in reporting year from Equation HH-1 of this section or the quantity of recovered CH₄ from Equation HH-4 of this section, whichever is greater (metric tons CH₄).

N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.

R_n = Quantity of recovered CH₄ from Equation HH-4 of this section for the nth measurement location (metric tons).

- OX = Oxidation fraction. Use the appropriate oxidation fraction default value from Table HH-4 of this subpart.
- DE_n = Destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99) for the nth measurement location. If the gas is transported off-site for destruction, use DE = 1. If the volumetric flow and CH₄ concentration of the recovered gas is measured at a single location providing landfill gas to multiple destruction devices (including some gas destroyed on-site and some gas sent off-site for destruction), calculate DE_n as the arithmetic average of the DE values determined for each destruction device associated with that measurement location.
- f_{Dest,n} = Fraction of hours the destruction device associated with the nth measurement location was operating during active gas flow calculated as the annual operating hours for the destruction device divided by the annual hours flow was sent to the destruction device as measured at the nth measurement location. If the gas is destroyed in a back-up flare (or similar device) or if the gas is transported off-site for destruction, use f_{Dest} = 1. If the volumetric flow and CH₄ concentration of the recovered gas is measured at a single location providing landfill gas to multiple destruction devices (including some gas destroyed on-site and some gas sent off-site for destruction), calculate f_{Dest,n} as the arithmetic average of the f_{Dest} values determined for each destruction device associated with that measurement location.

(ii) Calculate CH₄ generation and CH₄ emissions using measured CH₄ recovery and estimated gas collection efficiency and Equations HH-7 and HH-8 of this section.

$$MG = \frac{1}{CE} \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \times (1 - OX) \quad (\text{Eq. HH-7})$$

$$\text{Emissions} = \left[\left(\frac{1}{\text{CE}} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \right\} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times (1 - (\text{DE}_n \times f_{\text{Dest},n})) \right\} \right] \quad (\text{Eq. HH-8})$$

Where:

- MG = Methane generation, adjusted for oxidation, from the landfill in the reporting year (metric tons CH₄).
- Emissions = Methane emissions from the landfill in the reporting year (metric tons CH₄).
- N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.
- R_n = Quantity of recovered CH₄ from Equation HH-4 of this section for the nth measurement location (metric tons CH₄).
- CE = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.
- f_{Rec,n} = Fraction of hours the recovery system associated with the nth measurement location was operating (annual operating hours/8760 hours per year or annual operating hours / 8784 per year for a leap year).
- OX = Oxidation fraction. Use appropriate oxidation fraction default value from Table HH-4 of this subpart.
- DE_n = Destruction efficiency, (lesser of manufacturer's specified destruction efficiency and 0.99) for the nth measurement location. If the gas is transported off-site for destruction, use DE = 1. If the volumetric flow and CH₄ concentration of

the recovered gas is measured at a single location providing landfill gas to multiple destruction devices (including some gas destroyed on-site and some gas sent off-site for destruction), calculate DE_n as the arithmetic average of the DE values determined for each destruction device associated with that measurement location.

$f_{Dest,n}$ = Fraction of hours the destruction device associated with the n^{th} measurement location was operating during active gas flow calculated as the annual operating hours for the destruction device divided by the annual hours flow was sent to the destruction device as measured at the n^{th} measurement location. If the gas is destroyed in a back-up flare (or similar device) or if the gas is transported off-site for destruction, use $f_{Dest}=1$. If the volumetric flow and CH_4 concentration of the recovered gas is measured at a single location providing landfill gas to multiple destruction devices (including some gas destroyed on-site and some gas sent off-site for destruction), calculate $f_{Dest,n}$ as the arithmetic average of the f_{Dest} values determined for each destruction device associated with that measurement location.

71. Section 98.344 is amended by revising paragraph (e)

and adding paragraph (f) to read as follows:

§ 98.344 Monitoring and QA/QC requirements.

* * * * *

(e) For landfills electing to measure the fraction by volume of CH_4 in landfill gas (F), follow the requirements in paragraphs (e)(1) and (e)(2) of this section.

(1) Use a gas composition monitor capable of measuring the concentration of CH_4 on a dry basis that is properly operated, calibrated, and maintained according to the requirements

specified in paragraph (b) of this section. You must either use a gas composition monitor that is also capable of measuring the O₂ concentration correcting for excess (infiltration) air or you must operate, maintain, and calibrate a second monitor capable of measuring the O₂ concentration on a dry basis according to the manufacturer's specifications.

(2) Use Equation HH-10 of this section to correct the measured CH₄ concentration to 0% oxygen. If multiple CH₄ concentration measurements are made during the reporting year, determine F separately for each measurement made during the reporting year, and use the results to determine the arithmetic average value of F for use in Equation HH-1 of this part.

$$F = \left(\frac{C_{CH_4}}{100\%} \right) \times \left[\frac{20.9_c}{(20.9 - \%O_2)} \right] \quad (\text{Eq. HH-10})$$

Where:

F	=	Fraction by volume of CH ₄ in landfill gas (fraction, dry basis, corrected to 0% oxygen).
C _{CH₄}	=	Measured CH ₄ concentration in landfill gas (volume %, dry basis).
20.9 _c	=	Defined O ₂ correction basis, (volume %, dry basis).
20.9	=	O ₂ concentration in air (volume %, dry basis).
%O ₂	=	Measured O ₂ concentration in landfill gas (volume %, dry basis).

(f) The owner or operator shall document the procedures used to ensure the accuracy of the estimates of disposal quantities and, if applicable, gas flow rate, gas composition,

temperature, pressure, and moisture content measurements. These procedures include, but are not limited to, calibration of weighing equipment, fuel flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices shall also be recorded, and the technical basis for these estimates shall be provided.

72. Section 98.345 is amended by revising paragraph (c) to read as follows:

§ 98.345 Procedures for estimating missing data.

* * * * *

(c) For missing daily waste disposal quantity data for disposal in the reporting year, the substitute value shall be the average daily waste disposal quantity for that day of the week as measured on the week before and week after the missing daily data.

73. Section 98.346 is amended by revising paragraphs

(d)(1), (e), (h), (i)(5), (i)(8), (i)(10), (i)(11), and

(i)(12) to read as follows:

§ 98.346 Data reporting requirements.

* * * * *

(d) * * *

(1) Degradable organic carbon (DOC) and fraction of DOC dissimilated (DOC_F) values used in the calculations.

* * * * *

(e) Fraction of CH_4 in landfill gas (F), an indication of whether the fraction of CH_4 was determined based on measured values or the default value, and the methane correction factor used in the calculations. If an MCF other than the default of 1 is used, provide an indication of whether active aeration of the waste in the landfill was conducted during the reporting year, a description of the aeration system, including aeration blower capacity, the fraction of the landfill containing waste affected by aeration, the total number of hours during the year the aeration blower was operated, and other factors used as a basis for the selected MCF value.

* * * * *

(h) For landfills without gas collection systems, the annual methane emissions (i.e., the methane generation, adjusted for oxidation, calculated using Equation HH-5 of this subpart), reported in metric tons CH_4 , the oxidation fraction used in the calculation, and an indication of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in §98.6) are present at this landfill.

(i) * * *

(5) An indication of whether destruction occurs at the landfill facility, off-site, or both. If destruction occurs at the landfill facility, also report for each measurement location

an indication of whether a back-up destruction device is present at the landfill, the annual operating hours for the primary destruction device, the annual operating hours for the back-up destruction device (if present), and the destruction efficiency used (percent).

* * * * *

(8) Methane generation corrected for oxidation calculated using Equation HH-5 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

* * * * *

(10) Methane generation corrected for oxidation calculated using Equation HH-7 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

(11) Methane emissions calculated using Equation HH-6 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

(12) Methane emissions calculated using Equation HH-8 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

74. Section 98.348 is amended by adding definitions for "Landfill capacity" and "Leachate recirculation" in alphabetical order to read as follows:

§ 98.348 Definitions.

* * * * *

Landfill capacity means the maximum amount of solid waste a landfill can accept. For the purposes of this subpart, for landfills that have a permit, the landfill capacity can be determined in terms of volume or mass in the most recent permit issued by the state, local, or Tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert from volume to mass to determine its capacity, the calculation must include a site-specific density.

Leachate recirculation means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

* * * * *

75. Table HH-1 to Subpart HH is amended by revising the entry for "OX" as follows:

Table HH-1 to Subpart HH of Part 98—Emissions Factors, Oxidation Factors and Methods

Factor	Default value	Units
--------	---------------	-------

Factor	Default value	Units
* * * * *		
Other parameters—All MSW landfills		
* * * * *		
OX	See Table HH-4 of this subpart	
* * * * *		

76. Table HH-2 to Subpart HH is revised to read as follows:

Table HH-2 to Subpart HH of Part 98—U.S. Per Capita Waste Disposal Rates

Year	Waste per capita ton/cap/yr
1950	0.63
1951	0.63
1952	0.63
1953	0.63
1954	0.63
1955	0.63
1956	0.63
1957	0.63
1958	0.63
1959	0.63
1960	0.63
1961	0.64
1962	0.64
1963	0.65
1964	0.65
1965	0.66
1966	0.66
1967	0.67
1968	0.68
1969	0.68
1970	0.69
1971	0.69
1972	0.70
1973	0.71
1974	0.71

Year	Waste per capita ton/cap/yr
1975	0.72
1976	0.73
1977	0.73
1978	0.74
1979	0.75
1980	0.75
1981	0.76
1982	0.77
1983	0.77
1984	0.78
1985	0.79
1986	0.79
1987	0.80
1988	0.80
1989	0.83
1990	0.82
1991	0.76
1992	0.74
1993	0.76
1994	0.75
1995	0.70
1996	0.68
1997	0.69
1998	0.75
1999	0.75
2000	0.80
2001	0.91
2002	1.02
2003	1.02
2004	1.01
2005	0.98
2006	0.95
2007	0.95
2008	0.95
2009 and all later years	0.95

77. Table HH-4 to Subpart HH is added to read as follows:

Table HH-4 to Subpart HH of Part 98—Landfill Methane Oxidation Fractions

If your methane flux rate^a for the reporting year is:	Use this landfill methane oxidation fraction:
Less than 10 grams per square meter per day (g/m ² /d)	0.35

If your methane flux rate ^a for the reporting year is:	Use this landfill methane oxidation fraction:
10 to 70 g/m ² /d	0.25
Greater than 70 g/m ² /d	0.10

^aMethane flux rate (in grams per square meter per day; g/m²/d) is the mass flow rate of methane per unit area at the bottom of the surface soil prior to any oxidation and is calculated as follows.

For Equation HH-5 of this subpart, or for Equation TT-6 of subpart TT of this part,

$$MF = K \times G_{CH_4} / SArea$$

For Equation HH-6 of this subpart,

$$MF = K \times \left(G_{CH_4} - \sum_{n=1}^N R_n \right) / SArea$$

For Equations HH-7 of this subpart,

$$MF = K \times \left(\frac{1}{CE} \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \right) / SArea$$

For Equation HH-8 of this subpart,

$$MF = K \times \left(\frac{1}{CE} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \right\} - \sum_{n=1}^N R_n \right) / SArea$$

Where:

- MF = Methane flux rate from the landfill in the reporting year (grams per square meter per day, g/m²/d).
- K = unit conversion factor = 10⁶/365 (g/metric ton per days/year) or 10⁶/366 for a leap year.
- SArea = The surface area of the landfill containing waste at the beginning of the reporting year (square meters, m²).
- G_{CH₄} = Modeled methane generation rate in reporting year from Equation HH-1 of this subpart, or, for application with Equation HH-6 only, the greater of the modeled methane generation rate in reporting year from Equation HH-1 of this subpart

and the quantity of recovered CH₄ from Equation HH-4 of this subpart (metric tons CH₄).

- CE = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.
- N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.
- R_n = Quantity of recovered CH₄ from Equation HH-4 of this subpart for the nth measurement location (metric tons).
- f_{Rec,n} = Fraction of hours the recovery system associated with the nth measurement location was operating (annual operating hours/8760 hours per year or annual operating hours/8784 hours per year for a leap year).

Subpart II—[AMENDED]

78. Section 98.353 is amended by revising the parameters

"f_{Dest_1}" and "f_{Dest_2}" of Equation II-6 to read as follows:

§ 98.353 Calculating GHG emissions.

* * * * *

(d) * * *

(2) * * *

* * * * *

- f_{Dest_1} = Fraction of hours the primary destruction device was operating calculated as the annual hours when the destruction device was operating divided by the annual operating hours of the biogas recovery

system. If the biogas is transported off-site for destruction, use $f_{\text{Dest}} = 1$.

* * * * *

f_{Dest_2} = Fraction of hours the back-up destruction device was operating calculated as the annual hours when the destruction device was operating divided by the annual operating hours of the biogas recovery system.

* * * * *

Subpart LL—[AMENDED]

79. Section 98.386 is amended by:

- a. Removing and reserving paragraphs (a) (1) and (a) (5).
- b. Revising paragraph (a) (4), (a) (8), (a) (9) (v), and (a) (11) (v).
- c. Removing and reserving paragraph (a) (13).
- d. Revising paragraphs (a) (14), (a) (15) and (a) (18).
- e. Removing and reserving paragraph (b) (1).
- f. Revising paragraphs (b) (4), (b) (5) (v), and (b) (6) (i).
- g. Removing and reserving paragraph (c) (1).
- h. Revising paragraphs (c) (4), (c) (5) (v), (d) (2), and

(d) (3) to read as follows:

§ 98.386 Data reporting requirements.

* * * * *

(a) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a) (2) of this section.

* * * * *

(8) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a) (6) of this section.

(9) * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or per metric ton of product.

* * * * *

(11) * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or metric ton of product.

* * * * *

(14) For each specific type of biomass that enters the coal-to-liquid facility to be co-processed with fossil fuel-based feedstock to produce a product reported in paragraph (a) (6) of this section, report the annual quantity in metric tons or barrels.

(15) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a) (14) of this section.

* * * * *

(18) Annual CO₂ emissions in metric tons that would result from the complete combustion or oxidation of each type of biomass feedstock co-processed with fossil fuel-based feedstocks reported in paragraph (a)(14) of this section, calculated according to §98.393(c).

* * * * *

(b) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (b)(2) of this section.

(5) * * *

(v) The calculated CO₂ emissions factor in metric tons per barrel or per metric ton of product.

(6) * * *

(i) The density test results in metric tons per barrel.

* * * * *

(c) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (c)(2) of this section.

(5) * * *

(v) The calculated CO₂ emissions factor in metric tons per barrel or per metric ton of product.

* * * * *

(d) * * *

(2) For a product that enters the facility to be further refined or otherwise used on site that is a blended feedstock, producers must meet the reporting requirements of paragraph (a)(2) of this section by reflecting the individual components of the blended feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, producers, importers, and exporters must meet the reporting requirements of paragraphs (a)(6), (b)(2), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

Subpart MM—[AMENDED]

80. Section 98.393 is amended by:

a. Revising the parameter "Product_i" to Equation MM-1 in paragraph (a)(1).

b. Revising the parameter "Product_i" to Equation MM-1 in paragraph (a)(2).

c. Revising paragraphs (h)(1) introductory text and (h)(2) introductory text.

§ 98.393 Calculating GHG emissions.

(a) * * *

(1) * * *

* * * * *

Product_i = Annual volume of product "i" produced, imported, or exported by the reporting party (barrels). For refiners, this volume only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under §98.396(a)(2). For natural gas liquids, volumes shall reflect the individual components of the product as listed in Table MM-1 to subpart MM.

* * * * *

(2) * * *

* * * * *

Product_i = Annual mass of product "i" produced, imported, or exported by the reporting party (metric tons). For refiners, this mass only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under §98.396(a)(2).

* * * * *

(h) * * *

(1) A reporter using Calculation Method 1 to determine the emission factor of a petroleum product shall calculate the CO₂ emissions associated with that product using Equation MM-8 of this section in place of Equation MM-1 of this section.

* * * * *

(2) A refinery using Calculation Method 1 of this subpart to determine the emission factor of a non-crude petroleum feedstock shall calculate the CO₂ emissions associated with that feedstock using Equation MM-9 of this section in place of Equation MM-2 of this section.

* * * * *

81. Section 98.394 is amended by:

- a. Revising paragraphs (a)(1) introductory text and (a)(3).
- b. Adding paragraph (b)(3).
- c. Revising paragraph (c) introductory text.
- d. Removing and reserving paragraph (d).

§ 98.394 Monitoring and QA/QC requirements.

(a) * * *

(1) The quantity of petroleum products, natural gas liquids, and biomass, shall be determined as follows:

* * * * *

(3) The annual quantity of crude oil received shall be determined according to one of the following methods. You may use an appropriate standard method published by a consensus-based standards organization or you may use an industry standard practice.

(b) * * *

(3) For units and processes that operate continuously with infrequent outages, it may not be possible to complete the calibration of a flow meter or other measurement device without disrupting normal process operation. In such cases, the owner or operator may postpone the calibration until the next scheduled maintenance outage. The best available information from company records may be used in the interim. Such postponements shall be

documented in the monitoring plan that is required under §98.3(g)(5).

(c) Procedures for Calculation Method 2 of this subpart.

* * * * *

82. Section 98.395 is amended by:

- a. Revising paragraph (a) introductory text.
- b. Revising paragraph (b).
- c. Removing paragraph (c).

§ 98.395 Procedures for estimating missing data.

(a) Determination of quantity. Whenever the quality assurance procedures in §98.394(a) cannot be followed to measure the quantity of one or more petroleum products, natural gas liquids, types of biomass, feedstocks, or crude oil during any period (e.g., if a meter malfunctions), the following missing data procedures shall be used:

* * * * *

(b) Determination of emission factor. Whenever any of the procedures in §98.394(c) cannot be followed to develop an emission factor for any reason, Calculation Method 1 of this subpart must be used in place of Calculation Method 2 of this subpart for the entire reporting year.

83. Section 98.396 is amended by:

- a. Removing and reserving paragraph (a)(1).

- b. Revising paragraph (a) (4).
- c. Removing and reserving paragraph (a) (5).
- d. Revising paragraphs (a) (8), (a) (9) introductory text, (a) (9) (iii), (a) (9) (v), (a) (10) introductory text, (a) (11) introductory text, and (a) (11) (iii).
- e. Removing and reserving paragraph (a) (13).
- f. Revising paragraphs (a) (15) and (a) (18).
- g. Revising paragraphs (a) (20), (a) (21) and (a) (22).
- h. Removing paragraph (a) (23).
- i. Removing and reserving paragraph (b) (1).
- j. Revising paragraphs (b) (2), (b) (4), (b) (5) introductory text, and (b) (6) introductory text.
- k. Removing and reserving paragraph (c) (1).
- l. Revising paragraph (c) (4), (c) (5) introductory text, (c) (6) introductory text, (d) (2), and (d) (3).

§ 98.396 Data reporting requirements.

* * * * *

(a) * * *

(1) [Reserved]

* * * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a) (2) of this section.

(5) [Reserved]

* * * * *

(8) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a)(6) of this section.

(9) For every feedstock reported in paragraph (a)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(iii) The carbon share test results in percent mass.

* * * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or per metric ton of product.

(10) For every non-solid feedstock reported in paragraph (a)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(11) For every petroleum product and natural gas liquid reported in paragraph (a)(6) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(iii) The carbon share test results in percent mass.

* * * * *

(13) [Reserved]

* * * * *

(15) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a) (14) of this section.

* * * * *

(18) The CO₂ emissions in metric tons that would result from the complete combustion or oxidation of each type of biomass feedstock co-processed with petroleum feedstocks reported in paragraph (a) (14) of this section, calculated according to §98.393(c).

* * * * *

(20) For all crude oil that enters the refinery, report the annual quantity in barrels.

(21) The quantity of bulk NGLs in metric tons or barrels received for processing during the reporting year. Report only quantities of bulk NGLs not reported in (a) (2) of this section.

(22) Volume of crude oil in barrels that you injected into a crude oil supply or reservoir.

(b) In addition to the information required by §98.3(c), each importer shall report all of the following information at the corporate level:

(1) [Reserved]

(2) For each petroleum product and natural gas liquid listed in Table MM-1 of this subpart, report the annual quantity

in metric tons or barrels. For natural gas liquids, quantity shall reflect the individual components of the product.

* * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (b)(2) of this section.

(5) For each product reported in paragraph (b)(2) of this section for which Calculation Method 2 of this subpart used was used to determine an emissions factor, report:

* * * *

(6) For each non-solid product reported in paragraph (b)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * *

(c) * * *

(1) [Reserved]

* * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (c)(2) of this section.

(5) For each product reported in paragraph (c)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * *

(6) For each non-solid product reported in paragraph (c)(2) of this section for which Calculation Method 2 of this subpart used was used to determine an emissions factor, report:

* * * * *

(d) * * *

(2) For a product that enters the refinery to be further refined or otherwise used on site that is a blended non-crude feedstock, refiners must meet the reporting requirements of paragraphs (a)(2) of this section by reflecting the individual components of the blended non-crude feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, refiners, importers, and exporters must meet the reporting requirements of paragraphs (a)(6), (b)(2), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

84. Section 98.397 is amended by revising paragraphs (b) and (d) to read as follows:

§ 98.397 Records that must be retained.

* * * * *

(b) Reporters shall maintain records to support quantities that are reported under this subpart, including records documenting any estimations of missing data and the number of calendar days in the reporting year for which substitute data procedures were followed. For all reported quantities of

petroleum products, natural gas liquids, and biomass, reporters shall maintain metering, gauging, and other records normally maintained in the course of business to document product and feedstock flows including the date of initial calibration and the frequency of recalibration for the measurement equipment used.

* * * * *

(d) Reporters shall maintain laboratory reports, calculations and worksheets used in the measurement of density and carbon share for any petroleum product or natural gas liquid for which CO₂ emissions were calculated using Calculation Method 2.

* * * * *

85. Section 98.398 is amended by:

a. Adding the definitions for "Bulk NGLs" and "Natural Gas Liquids (NGLs)" in alphabetical order.

b. Removing the definition of "Batch".

§ 98.398 Definitions.

* * * * *

Bulk NGLs for purposes of reporting under this subpart means mixtures of NGLs that are sold or delivered as undifferentiated product.

Natural Gas Liquids (NGLs) for the purposes of reporting under this subpart means hydrocarbons that are separated from

natural gas as liquids through the process of absorption, condensation, adsorption, or other methods, and are sold or delivered as differentiated product. Generally, such liquids consist of ethane, propane, butanes, or pentanes plus.

86. Table MM-1 to Subpart MM is amended by:

- a. Revising the entries for Ethane, Ethylene, Propane, Propylene, Butane, Butylene, Isobutane, and Isobutylene.
- b. Adding footnotes 3 and 4.

Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids^{1 2}

Products	Column A: density (metric tons/bbl)	Column B: carbon share (% of mass)	Column C: emission factor (metric tons CO ₂ /bbl)
* * * * *			
Other Petroleum Products and Natural Gas Liquids			
* * * * *			
Ethane ³	0.0579	79.89	0.170
Ethylene ⁴	0.0492	85.63	0.154
Propane ³	0.0806	81.71	0.241
Propylene ³	0.0827	85.63	0.260
Butane ³	0.0928	82.66	0.281
Butylene ³	0.0972	85.63	0.305
Isobutane ³	0.0892	82.66	0.270
Isobutylene ³	0.0949	85.63	0.298
* * * * *			

¹ In the case of products blended with some portion of biomass-based fuel, the carbon share in Table MM-1 of this subpart represents only the petroleum-based components.

² Products that are derived entirely from biomass should not be reported, but products that were derived from both biomass and a petroleum product (i.e., co-processed) should be reported as the petroleum product that it most closely represents.

³The density and emission factors for components of LPG determined at 60 degrees Fahrenheit and saturation pressure (LPGs other than ethylene)

⁴The density and emission factor for ethylene determined at 41 degrees Fahrenheit and saturation pressure.

Subpart NN—[AMENDED]

87. Section 98.400 is amended by revising paragraphs (a) and (b) to read as follows:

§ 98.400 Definition of the source category.

* * * * *

(a) Natural gas liquids fractionators are installations that fractionate natural gas liquids (NGLs) into their constituent liquid products or mixtures of products (ethane, propane, normal butane, isobutane or pentanes plus) for supply to downstream facilities.

(b) Local Distribution Companies (LDCs) are companies that own or operate distribution pipelines, not interstate pipelines or intrastate pipelines, that physically deliver natural gas to end users and that are within a single state that are regulated as separate operating companies by State public utility commissions or that operate as independent municipally-owned distribution systems. LDCs do not include pipelines (both interstate and intrastate) delivering natural gas directly to major industrial users and farm taps upstream of the local distribution company inlet.

* * * * *

88. Section 98.403 is amended by:

- a. Revising the parameter "Fuel_h" to Equation NN-2.
- b. Revising paragraphs (b)(1) introductory text and (b)(2)(i).
- c. Revising parameters "CO_{2k}" and "Fuel" to Equation NN-4.
- d. Revising paragraph (b)(3).
- e. Revising paragraph (b)(4).
- f. Revising paragraph (c)(2) introductory text.
- g. Revising parameter "CO₂" to Equation NN-8.

§ 98.403 Calculating GHG emissions.

(a) * * *

(2) * * *

* * *

Fuel_h = Total annual volume of product "h" supplied
(volume per year, in Mscf for natural gas and bbl
for NGLs).

* * *

(b) * * *

(1) For natural gas that is received for redelivery to downstream gas transmission pipelines and other local distribution companies, use Equation NN-3 of this section and the default values for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, reporter-specific CO₂ emission factors may be used, provided they are developed using methods outlined in §98.404.

* * *

(2)(i) For natural gas delivered to end-users registering a supply equal to or greater than 460,000 Mscf per year, use Equation NN-4 of this section and the default values for the CO₂ emission factors found in Table NN-2 of this subpart.

(ii)	*	*	*
*	*	*	*
CO ₂ k	=	Annual CO ₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to each end-user that receives a supply equal to or greater than 460,000 Mscf per year (metric tons).	
Fuel	=	Total annual volume of natural gas supplied to this end-user, if known, otherwise, the annual volume supplied to this meter (Mscf per year).	
*	*	*	*

(3) For the net change in natural gas stored on system by the LDC during the reporting year, use Equation NN-5a of this section. For natural gas that is received by means other than through the city gate, and is not otherwise accounted for by Equation NN-1 or NN-2 of this section, use Equation NN-5b of this section.

(i) For natural gas received by the LDC that is injected into on-system storage, and/or liquefied and stored, and for gas removed from storage and used for deliveries, use Equation NN-5a of this section and the default value for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, a

reporter-specific CO₂ emission factor may be used, provided it is developed using methods outlined in §98.404.

$$CO_{21} = [Fuel_1 + Fuel_2] * EF \quad (\text{Eq. NN-5a})$$

Where:

- CO₂₁ = Annual CO₂ mass emissions that would result from the combustion or oxidation of the net change in natural gas stored on system by the LDC within the reporting year (metric tons).
- Fuel₁ = Total annual volume of natural gas added to storage on-system or liquefied and stored in the reporting year (Mscf per year).
- Fuel₂ = Total annual volume of natural gas that is removed from storage or vaporized and removed from storage and used for deliveries to customers or other LDCs by the LDC within the reporting year (Mscf per year).
- EF = Annual average CO₂ emission factor for natural gas placed into/removed from storage (MT CO₂/Mscf).

(ii) For natural gas received by the LDC that bypassed the city gate, use Equation NN-5b of this section. This includes natural gas received directly by LDC systems from producers or natural gas processing plants from local production, received as a liquid and vaporized for delivery, or received from any other source that bypassed the city gate. Use the default value for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, a reporter-specific CO₂ emission factor may be used, provided it is developed using methods outlined in §98.404.

$$CO_{2n} = Fuel_x * EF_x \quad (\text{Eq. NN-5b})$$

Where:

CO_{2n} = Annual CO_2 mass emissions that would result from the combustion or oxidation of natural gas received that bypassed the city gate and is not otherwise accounted for by Equation NN-1 or NN-2 of this section (metric tons).

$Fuel_z$ = Total annual volume of natural gas received that was not otherwise accounted for by Equation NN-1 or NN-2 of this section (natural gas from producers and natural gas processing plants from local production, or natural gas that was received as a liquid, vaporized and delivered, and any other source that bypassed the city gate). (Mscf per year)

EF_z = Fuel-specific CO_2 emission factor (MT CO_2 /Mscf)

(4) Calculate the total CO_2 emissions that would result from the complete combustion or oxidation of the annual supply of natural gas to end-users that receive a supply less than 460,000 Mscf per year using Equation NN-6 of this section.

$$CO_2 = CO_{2i} + CO_{2n} - CO_{2f} - \sum CO_{2k} - CO_{2l} \quad (\text{Eq. NN-6})$$

Where:

CO_2 = Annual CO_2 mass emissions that would result from the combustion or oxidation of natural gas delivered to LDC end-users not covered in paragraph (b)(2) of this section (metric tons).

CO_{2i} = Annual CO_2 mass emissions that would result from the combustion or oxidation of natural gas received at the city gate as calculated in paragraph (a)(1) or (a)(2) of this section (metric tons).

CO_{2n} = Annual CO_2 mass emissions that would result from the combustion or oxidation of natural gas that was received by the LDC directly from sources bypassing the city gate, and is not otherwise accounted for in Equation NN-1 or NN-2 of this

section, as calculated in paragraph (b) (3) (ii) of this section (metric tons).

CO_{2j} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to transmission pipelines or other LDCs as calculated in paragraph (b) (1) of this section (metric tons).

CO_{2k} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to each end-user that receives a supply equal to or greater than 460,000 Mscf per year as calculated in paragraph (b) (2) of this section (metric tons).

CO_{2l} = Annual CO₂ mass emissions that would result from the combustion or oxidation of the net change in natural gas stored by the LDC within the reported year as calculated in paragraph (b) (3) (i) of this section (metric tons).

(c) * * *

(2) Calculate the total CO₂ equivalent emissions that would result from the combustion or oxidation of fractionated NGLs supplied less the quantity received from other fractionators using Equation NN-8 of this section.

* * * * *

CO₂ = Annual CO₂ mass emissions that would result from the combustion or oxidation of fractionated NGLs delivered to customers or on behalf of customers less the quantity received from other fractionators (metric tons).

* * * * *

89. Section 98.404 is amended by:

a. Revising paragraphs (a) (5) introductory text, (a) (7), (a) (8) introductory text, and (a) (8) (ii).

b. Adding paragraph (a) (8) (iii).

c. Revising paragraphs (a) (9), (c) (2), (d) (1), and (d) (2).

d. Adding paragraph (d) (3).

§ 98.404 Monitoring and QA/QC requirements.

(a) * * *

(5) For an LDC using Equation NN-1 or NN-2 of this subpart, the point(s) of measurement for the natural gas volume received shall be the LDC city gate meter(s).

* * * * *

(7) An LDC using Equation NN-4 of this subpart shall measure natural gas at the end-user's meter(s). Where an end-user is known to have more than one meter located at their facility, the reporter shall measure the natural gas at each meter and sum the annual volume delivered to all meters located at the end-user's facility to determine the total volume delivered to the end-user. Otherwise, the reporter shall consider the total annual volume delivered through each single meter at a single particular location to be the volume delivered to an individual end-user.

(8) An LDC using Equation NN-5a and/or NN-5b of this subpart shall measure natural gas as follows:

* * * * *

(ii) Fuel₂ shall be measured at the meters used for measuring on-system storage withdrawals and/or LNG vaporization injection.

(iii) Fuel_z shall be measured using established business practices.

(9) An LDC shall measure all natural gas under the following standard industry temperature and pressure conditions: Cubic foot of gas at a temperature of 60 degrees Fahrenheit and at an absolute pressure of one atmosphere.

* * * *

(c) * *

(2) When a reporter used the default EF provided in this section to calculate Equation NN-2, NN-3, NN-4, NN-5a, NN-5b, or NN-7 of this subpart, the appropriate value shall be taken from Table NN-2 of this subpart.

* * * *

(d) * *

(1) Equipment used to measure quantities in Equations NN-1, NN-2, NN-5a and NN-5b of this subpart shall be calibrated prior to its first use for reporting under this subpart, using a suitable standard method published by a consensus based standards organization or according to the equipment manufacturer's directions.

(2) Equipment used to measure quantities in Equations NN-1, NN-2, NN-5a, and NN-5b of this subpart shall be recalibrated at the frequency specified by the standard method used or by the manufacturer's directions.

(3) Equipment used to measure quantities in Equations NN-3 and NN-4 of this subpart shall be recalibrated at the frequency commonly used within the industry.

90. Section 98.405 is amended by removing and reserving paragraph (c) (3).

91. Section 98.406 is amended by:

- a. Revising paragraph (a) (4).
- b. Revising paragraphs (a) (7), (b) (2), and (b) (3).
- c. Removing and reserving paragraph (b) (4).
- d. Revising paragraphs (b) (5), (b) (7), (b) (9), and (b) (12)

introductory text.

§ 98.406 Data reporting requirements.

(a) * * *

(4) Annual quantities (in barrels) of y-grade, o-grade, and other bulk NGLs:

(i) Received.

(ii) Supplied to downstream users that are not fractionated by the reporter.

* * * * *

(7) Annual CO₂ mass emissions (metric tons) that would result from the combustion or oxidation of fractionated NGLs supplied less the quantity received from other fractionators, calculated in accordance with §98.403(c)(2). If the calculated value is negative, the reporter shall report the value as zero.

* * * * *

(b) * * *

(2) Annual volume in Mscf of natural gas placed into storage or liquefied and stored (Fuel₁ in Equation NN-5a).

(3) Annual volume in Mscf of natural gas withdrawn from on-system storage and annual volume in Mscf of vaporized liquefied natural gas (LNG) withdrawn from storage for delivery on the distribution system (Fuel₂ in Equation NN-5a).

(4) [Reserved]

(5) Annual volume in Mscf of natural gas that bypassed the city gate(s) and was supplied through the LDC distribution system. This includes natural gas from producers and natural gas processing plants from local production, or natural gas that was vaporized upon receipt and delivered, and any other source that bypassed the city gate (Fuel_z in Equation NN-5b).

* * * * *

(7) Annual volume in Mscf of natural gas delivered by the LDC to each end-user facility that received from the LDC deliveries equal to or greater than 460,000 Mscf during the

calendar year, if known; otherwise, report the annual volume in Mscf of natural gas delivered by the LDC to each meter registering supply equal to or greater than 460,000 Mscf during the calendar year.

* * * * *

(9) Annual CO₂ emissions (metric tons) that would result from the complete combustion or oxidation of the annual supply of natural gas to end-users registering less than 460,000 Mscf, calculated in accordance with §98.403(b)(4). If the calculated value is negative, the reporter shall report the value as zero.

* * * * *

(12) The customer name, address, and meter number of each end-user reported in paragraph (b)(7) of this section. Additionally, report whether the quantity of natural gas reported in paragraph (b)(7) of this section is the total quantity delivered to the end-user, or the quantity delivered to a specific meter.

* * * * *

92. Section 98.407 is amended by revising the introductory text to read as follows:

§ 98.407 Records that must be retained.

In addition to the information required by §98.3(g), the reporter shall retain the following records:

* * * * *

93. Tables NN-1 and NN-2 to subpart NN are revised to read as follows:

Table NN-1 to Subpart NN of Part 98—Default Factors for Calculation Methodology 1 of This Subpart

Fuel	Default higher heating value¹	Default CO₂ emission factor (kg CO₂/MMBtu)
Natural Gas	1.026 MMBtu/Mscf	53.06
Propane	3.84 MMBtu/bbl	62.87
Normal butane	4.34 MMBtu/bbl	64.77
Ethane	2.85 MMBtu/bbl	59.60
Isobutane	4.16 MMBtu/bbl	64.94
Pentanes plus	4.62 MMBtu/bbl	70.02

¹ Conditions for higher heating values presented in MMBtu/bbl are 60°F and saturation pressure.

Table NN-2 to Subpart NN of Part 98—Default Values for Calculation Methodology 2 of This Subpart

Fuel	Unit	Default CO₂ emission value (MT CO₂/Unit) ¹
Natural Gas	Mscf	0.0544
Propane	Barrel	0.241
Normal butane	Barrel	0.281
Ethane	Barrel	0.170
Isobutane	Barrel	0.270
Pentanes plus	Barrel	0.324

¹ Conditions for emission value presented in MT CO₂/bbl are 60°F and saturation pressure.

Subpart PP—[AMENDED]

94. Section 98.423 is amended by revising paragraph

(a)(3)(i) introductory text to read as follows:

§ 98.423 Calculating CO₂ supply.

(a) * * *

(3) * * *

(i) For facilities with production process units or production wells that capture or extract a CO₂ stream and either measure it after segregation or do not segregate the flow, calculate the total CO₂ supplied in accordance with Equation PP-3a.

* * * * *

95. Section 98.426 is amended by revising paragraphs

(b) (4) (i), (b) (4) (ii), (f) (10), and (f) (11) to read as follows:

§ 98.426 Data reporting requirements.

* * * * *

(b) * * *

(4) * * *

(i) Quarterly density of the CO₂ stream in metric tons per standard cubic meter if you report the concentration of the CO₂ stream in paragraph (b) (3) of this section in weight percent.

(ii) Quarterly density of CO₂ in metric tons per standard cubic meter if you report the concentration of the CO₂ stream in paragraph (b) (3) of this section in volume percent.

* * * * *

(f) * * *

(10) Injection of CO₂ for enhanced oil and natural gas recovery that is covered by subpart UU of this part.

(11) Geologic sequestration of carbon dioxide that is covered by subpart RR of this part.

* * * * *

Subpart QQ—[AMENDED]

96. Section 98.433 is amended by revising the parameter

“St” of Equation QQ-1 and Equation QQ-2 to read as follows:

§ 98.433 Calculating GHG contained in pre-charged equipment or closed-cell foams.

(a) * * *

* * * * *

S_t = Mass of fluorinated GHG per unit of equipment type t or foam type t (charge per piece of equipment, kg) or density of fluorinated GHG in foam (charge per cubic foot of foam, kg per cubic foot).

* * * * *

(b) * * *

* * * * *

S_t = Mass in CO₂e of the fluorinated GHGs per unit of equipment type t or foam type t (charge per piece of equipment, kg) or density of fluorinated GHG in foam (CO₂e per cubic foot of foam, kg CO₂e per cubic foot).

* * * * *

97. Section 98.434 is amended by revising paragraph (b) to read as follows:

§ 98.434 Monitoring and QA/QC requirements.

* * * *

(b) The inputs to the annual submission must be reviewed against the import or export transaction records to ensure that the information submitted to EPA is being accurately transcribed as the correct chemical or blend in the correct pre-charged equipment or closed-cell foam in the correct quantities and units.

98. Section 98.436 is amended by:

a. Revising paragraphs (a)(3), (a)(4), (a)(6)(ii), (a)(6)(iii), (b)(3), (b)(4), (b)(6)(ii), and (b)(6)(iii).

b. Removing and reserving paragraphs (a)(5), (a)(6)(iv), (b)(5), and (b)(6)(iv).

§ 98.436 Data reporting requirements.

(a) * * *

(3) For closed-cell foams that are imported inside of equipment, the identity of the fluorinated GHG contained in the foam, the mass of the fluorinated GHG contained in the foam in each piece of equipment, and the number of pieces of equipment imported with each unique combination of mass and identity of fluorinated GHG within the closed-cell foams.

(4) For closed cell-foams that are not imported inside of equipment, the identity of the fluorinated GHG in the foam, the density of the fluorinated GHG in the foam (kg fluorinated GHG/cubic foot), and the volume of foam imported (cubic feet) for each type of closed-cell foam with a unique combination of fluorinated GHG density and identity.

(5) [Reserved]

(6) * * *

(ii) For closed-cell foams that are imported inside of equipment, the mass of the fluorinated GHGs in CO₂e contained in the foam in each piece of equipment and the number of pieces of equipment imported for each equipment type.

(iii) For closed-cell foams that are not imported inside of equipment, the density in CO₂e of the fluorinated GHGs in the foam (kg CO₂e/cubic foot) and the volume of foam imported (cubic feet) for each type of closed-cell foam.

(iv) [Reserved]

* * * * *

(b) * * *

(3) For closed-cell foams that are exported inside of equipment, the identity of the fluorinated GHG contained in the foam in each piece of equipment, the mass of the fluorinated GHG contained in the foam in each piece of equipment, and the number pieces of equipment exported with each unique combination of

mass and identity of fluorinated GHG within the closed-cell foams.

(4) For closed-cell foams that are not exported inside of equipment, the identity of the fluorinated GHG in the foam, the density of the fluorinated GHG in the foam (kg fluorinated GHG/cubic foot), and the volume of foam exported (cubic feet) for each type of closed-cell foam with a unique combination of fluorinated GHG density and identity.

(5) [Reserved]

(6) * * *

(ii) For closed-cell foams that are exported inside of equipment, the mass of the fluorinated GHGs in CO₂e contained in the foam in each piece of equipment and the number of pieces of equipment imported for each equipment type.

(iii) For closed-cell foams that are not exported inside of equipment, the density in CO₂e of the fluorinated GHGs in the foam (kg CO₂ e/cubic foot) and the volume of foam imported (cubic feet) for each type of closed-cell foam.

(iv) [Reserved]

* * * * *

99. Section 98.438 is amended by revising the definitions for "Closed-cell foam" and "Pre-charged electrical equipment component" to read as follows:

§ 98.438 Definitions.

* * * * *

Closed-cell foam means any foam product, excluding packaging foam, that is constructed with a closed-cell structure and a blowing agent containing a fluorinated GHG. Closed-cell foams include but are not limited to polyurethane (PU) foam contained in equipment, PU continuous and discontinuous panel foam, PU one component foam, PU spray foam, extruded polystyrene (XPS) boardstock foam, and XPS sheet foam. Packaging foam means foam used exclusively during shipment or storage to temporarily enclose items.

* * * * *

Pre-charged electrical equipment component means any portion of electrical equipment that is charged with a fluorinated greenhouse gas prior to sale or distribution or offer for sale or distribution in interstate commerce.

Subpart RR—[AMENDED]

100. Section 98.443 is amended by:

- a. Revising the parameter " $S_{r,p}$ " of Equation RR-2 at paragraph (a)(2).
- b. Revising paragraph (d)(3) introductory text.
- c. Revising the parameter " CO_{2FI} " of Equation RR-12.

§ 98.443 Calculating CO_2 geologic sequestration.

* * * * *

(a) * * *

(2) * * *

* * * * *

$S_{r,p}$ = Quarterly volume of contents in containers r redelivered to another facility without being injected into your well in quarter p (standard cubic meters).

* * * * *

(d) * * *

(3) To aggregate production data, you must sum the mass of all of the CO₂ separated at each gas-liquid separator in accordance with the procedure specified in Equation RR-9 of this section. You must assume that the total CO₂ measured at the separator(s) represents a percentage of the total CO₂ produced. In order to account for the percentage of CO₂ produced that is estimated to remain with the produced oil or other fluid, you must multiply the quarterly mass of CO₂ measured at the separator(s) by a percentage estimated using a methodology in your approved MRV plan. If fluids containing CO₂ from injection wells covered under this source category are produced and not processed through a gas-liquid separator, the concentration of CO₂ in the produced fluids must be measured at a flow meter located prior to reinjection or reuse using methods in §98.444(f)(1). The considerations you intend to use to calculate CO₂ from produced fluids for the mass balance equation must be

described in your approved MRV plan in accordance with §98.448(a)(5).

* * * * *

(f) * * *

(2) * * *

* * * * *

CO_{2FI} = Total annual CO₂ mass emitted (metric tons) from equipment leaks and vented emissions of CO₂ from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in subpart W of this part.

101. Section 98.446 is amended by revising paragraph

(b)(5) to read as follows:

§ 98.446 Data reporting requirements.

* * * * *

(b) * * *

(5) The standard or method used to calculate each value in paragraphs (b)(1), (b)(2), and (b)(3) of this section.

* * * * *

Subpart SS—[AMENDED]

102. Section 98.453 is amended by:

- a. Revising paragraph (d).
- b. Revising paragraph (h).
- c. Revising the parameter "MF" of Equation SS-6.

§ 98.453 Calculating GHG emissions.

* * * * *

(d) Estimate the mass of SF₆ or PFCs disbursed to customers in new equipment or cylinders over the period p by monitoring the mass flow of the SF₆ or PFCs into the new equipment or cylinders using a flowmeter, or by weighing containers before and after gas from containers is used to fill equipment or cylinders, or by using the nameplate capacity of the equipment.

* * * * *

(h) If the mass of SF₆ or the PFC disbursed to customers in new equipment or cylinders over the period p is determined by using the nameplate capacity, or by using the nameplate capacity of the equipment and calculating the partial shipping charge, use the methods in either paragraph (h)(1) or (h)(2) of this section.

(1) Determine the equipment's actual nameplate capacity, by measuring the nameplate capacities of a representative sample of each make and model and calculating the mean value for each make and model as specified at §98.454(f).

(2) If equipment is shipped with a partial charge, calculate the partial shipping charge by multiplying the nameplate capacity of the equipment by the ratio of the densities of the partial charge to the full charge.

(i) * * *

* * * * *

MF = The total annual mass of the SF₆ or PFCs, in pounds, used to fill equipment during equipment installation at electric transmission or distribution facilities.

* * * * *

103. Section 98.456 is amended by revising paragraphs (m), (o), and (p) to read as follows:

§ 98.456 Data reporting requirements.

* * * * *

(m) The values for EF_{ci} of Equation SS-5 of this subpart for each hose and valve combination and the associated valve fitting sizes and hose diameters.

* * * * *

(o) If the mass of SF₆ or the PFC disbursed to customers in new equipment over the period p is determined according to the methods required in §98.453(h), report the mean value of nameplate capacity in pounds for each make, model, and group of conditions.

(p) If the mass of SF₆ or the PFC disbursed to customers in new equipment over the period p is determined according to the methods required in §98.453(h), report the number of samples and the upper and lower bounds on the 95 percent confidence interval for each make, model, and group of conditions.

* * * * *

Subpart TT—[AMENDED]

104. Section 98.460 is amended by revising paragraph

(c)(2)(xiii) to read as follows:

§ 98.460 Definition of the source category.

* * * * *

(c) * * *

(2) * * *

(xiii) Other waste material that has a DOC value of 0.3 weight percent (on a wet basis) or less. DOC value must be determined using a 60-day anaerobic biodegradation test procedure identified in §98.464(b)(4)(i).

* * * * *

105. Section 98.463 is amended by:

a. Revising the parameter " DOC_F " of Equation TT-1.

b. Removing the parameter " F_x " of Equation TT-1 and adding in its place the parameter " F ".

c. Revising Equation TT-4b.

d. Revising the parameter " OX " of Equation TT-6.

§ 98.463 Calculating GHG emissions.

(a) * * *

(1) * * *

* * * * *

DOC_F = Fraction of DOC dissimilated (fraction); use the default value of 0.5. If measured values of DOC are available using the 60-day anaerobic biodegradation test procedure identified in 98.464(b)(4)(i), use a default value of 1.0.

* * * * *

F = Fraction by volume of CH₄ in landfill gas (fraction, dry basis, corrected to 0% oxygen). If you have a gas collection system, use the annual average CH₄ concentration from measurement data for the current reporting year; otherwise, use the default value of 0.5.

* * * * *

(2) * * *

(ii) * * *

(C) * * *

* * * * *

$$W_x = \frac{WIP - \sum_{n=1}^{NYrData} W_{meas,n}}{(YrLast - YrOpen + 1 - NYrData)} \quad (\text{Eq. TT-4b})$$

* * * * *

(b) * * *

(1) * * *

* * * * *

OX = Oxidation fraction from Table HH-4 of subpart HH of this part.

* * * * *

106. Section 98.464 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Revising Equation TT-7.
- c. Removing the parameters "DOC_F", "MCD_{control}", and

"MC_{control}" of Equation TT-7.

d. Revising paragraph (c).

§ 98.464 Monitoring and QA/QC requirements.

* * * * *

(b) For each waste stream placed in the landfill during the reporting year for which you choose to determine volatile solids concentration and/or a waste stream-specific DOC_x , you must collect and test a representative sample of that waste stream using the methods specified in paragraphs (b)(1) through (b)(4) of this section, as applicable.

* * * * *

(4) * * *

(i) * * *

(E) * * *

$$\text{DOC}_x = \frac{\text{MCD}_{\text{sample},x}}{M_{\text{sample},x}} \quad (\text{Eq. TT-7})$$

Where:

DOC_x = Degradable organic content of the waste stream in Year X (weight fraction, wet basis)

$\text{MCD}_{\text{sample},x}$ = Mass of carbon degraded in the waste stream sample in Year X as determined in paragraph (b)(4)(i)(C) of this section [milligrams (mg)].

$M_{\text{sample},x}$ = Mass of waste stream sample used in the anaerobic degradation test in Year X (mg, wet basis).

* * * * *

(c) For each waste stream that was historically managed in the landfill but was not received during the first reporting

year for which you choose to determine volatile solids concentration and/or a waste stream-specific DOC_x , you must determine volatile solids concentration or DOC_x of the waste stream as initially placed in the landfill using the methods specified in paragraph (c)(1) or (c)(2) of this section, as applicable.

(1) If you can identify a similar waste stream to the waste stream that was historically managed in the landfill, you must determine the volatile solids concentration or DOC_x of the similar waste stream using the applicable procedures in paragraphs (b)(1) through (b)(4) of this section.

(2) If you cannot identify a similar waste stream to the waste stream that was historically managed in the landfill, you may determine the volatile solids concentration or DOC_x of the historically managed waste stream using process knowledge. You must document the basis for the volatile solids concentration or DOC_x value as determined through process knowledge.

* * * * *

107. Section 98.466 is amended by:

- a. Revising paragraph (b)(1).
- b. Adding paragraph (b)(5).
- c. Revising paragraph (c) introductory text.
- d. Removing and reserving paragraph (c)(1).

e. Revising paragraphs (c) (2), (c) (3) introductory text, and (c) (4) introductory text.

f. Adding paragraph (c) (5).

g. Revising paragraph (d) (3).

h. Revising paragraph (h).

§ 98.466 Data reporting requirements.

* * * * *

(b) * * *

(1) The number of waste streams (including "Other Industrial Solid Waste (not otherwise listed)" and "Inerts") for which Equation TT-1 of this subpart is used to calculate modeled CH₄ generation.

* * * * *

(5) For each waste stream, the decay rate (k) value used in the calculations.

(c) Report the following historical waste information:

(1) [Reserved]

(2) For each waste stream identified in paragraph (b) of this section, the method(s) for estimating historical waste disposal quantities and the range of years for which each method applies.

(3) For each waste stream identified in paragraph (b) of this section for which Equation TT-2 of this subpart is used, provide:

* * * *

(4) If Equation TT-4a of this subpart is used, provide:

* * * *

(5) If Equation TT-4b of this subpart is used, provide:

(i) WIP (i.e., the quantity of waste in-place at the start of the reporting year from design drawings or engineering estimates (metric tons) or, for closed landfills for which waste in-place quantities are not available, the landfill's design capacity).

(ii) The cumulative quantity of waste placed in the landfill for the years for which disposal quantities are available from company record or from Equation TT-3 of this part.

(iii) YrLast.

(iv) YrOpen.

(v) NYrData.

(d) * * *

(3) For each waste stream, the degradable organic carbon (DOC_x) value (mass fraction) for the specified year and an indication as to whether this was the default value from Table TT-1 to this subpart, a measured value using a 60-day anaerobic biodegradation test as specified in §98.464(b)(4)(i), or a value based on total and volatile solids measurements as specified in

§98.464(b)(4)(ii). If DOC_x was determined by a 60-day anaerobic biodegradation test, specify the test method used.

* * * * *

(h) For landfills with gas collection systems, in addition to the reporting requirements in paragraphs (a) through (f) of this section, provide:

(1) The annual methane generation, adjusted for oxidation, calculated using Equation TT-6 of this subpart, reported in metric tons CH_4 ;

(2) The oxidation factor used in Equation TT-6 of this subpart; and

(3) All information required under 40 CFR 98.346(i)(1) through (i)(7) and 40 CFR 98.346(i)(9) through (i)(12).

108. Section 98.467 is revised to read as follows:

§ 98.467 Records that must be retained.

In addition to the information required by §98.3(g), you must retain the calibration records for all monitoring equipment, including the method or manufacturer's specification used for calibration, and all measurement data used for the purposes of paragraphs §98.460(c)(2)(xii) or (c)(2)(xiii) or used to determine waste stream-specific DOC_x values for use in Equation TT-1 of this subpart.

109. Table TT-1 to Subpart TT is amended by:

a. Revising the first four entries.

b. Adding a new entry following "Construction and Demolition".

Table TT-1 to Subpart TT—Default DOC and Decay Rate Values for Industrial Waste Landfills

Industry/Waste Type	DOC (weight fraction, wet basis)	k [dry climate ^a] (yr ⁻¹)	k [moderate climate ^a] (yr ⁻¹)	k [wet climate ^a] (yr ⁻¹)
Food Processing (other than sludge)	0.22	0.06	0.12	0.18
Pulp and Paper (other than sludge)	0.20	0.02	0.03	0.04
Wood and Wood Product (other than sludge)	0.43	0.02	0.03	0.04
Construction and Demolition	0.08	0.02	0.03	0.04
Industrial Sludge	0.09	0.02	0.04	0.06
* * * * *				

^a The applicable climate classification is determined based on the annual rainfall plus the recirculated leachate application rate. Recirculated leachate application rate (in inches/year) is the total volume of leachate recirculated from company records or engineering estimates and applied to the landfill divided by the area of the portion of the landfill containing waste [with appropriate unit conversions].

(1) Dry climate = precipitation plus recirculated leachate less than 20 inches/year

(2) Moderate climate = precipitation plus recirculated leachate from 20 to 40 inches/year (inclusive)

(3) Wet climate = precipitation plus recirculated leachate greater than 40 inches/year

Alternatively, landfills that use leachate recirculation can elect to use the k value for wet climate rather than calculating the recirculated leachate rate.

(1) Dry climate = precipitation plus recirculated leachate less than 20 inches/year.

(2) Moderate climate = precipitation plus recirculated leachate from 20 to 40 inches/year (inclusive).

(3) Wet climate = precipitation plus recirculated leachate greater than 40 inches/year.

Subpart UU—[AMENDED]

110. Section 98.473 is amended by revising:

a. The parameter "D" of Equation UU-2 in paragraph (a) (2).

b. The parameter " $S_{r,p}$ " of Equation UU-2 in paragraph (b) (2).

§ 98.473 Calculating CO₂ received.

(a) * * *

(2) * * *

* * *

D = Density of CO₂ at standard conditions (metric tons per standard cubic meter): 0.0018682.

* * *

(b) * * *

(2) * * *

* * *

$S_{r,p}$ = Quarterly volume of contents in containers r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).

* * *

111. Section 98.476 is amended by:

a. Revising paragraph (b) (5).

b. Adding paragraph (e).

§ 98.476 Data reporting requirements.

* * *

(b) * * *

(5) The standard or method used to calculate each value in paragraphs (b) (1), (b) (2), and (b) (3) of this section.

* * * * *

(e) Report the following:

(1) Whether the facility received a Research and Development project exemption from reporting under 40 CFR part 98, subpart RR, for this reporting year. If you received an exemption, report the start and end dates of the exemption approved by EPA.

(2) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations to enhance the recovery of oil during this reporting year.

(3) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations to enhance the recovery of natural gas during this reporting year.

(4) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations for acid gas disposal during this reporting year.

(5) Whether the facility includes a well or group of wells where a CO₂ stream was injected for a purpose other than those listed in paragraphs (e) (1) through (4) of this section. If you

injected CO₂ for another purpose, report the purpose of the injection.

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